# Coal Age

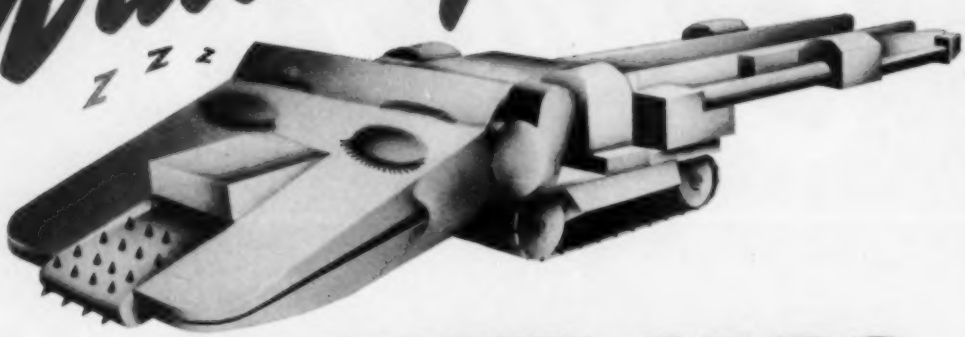
**WHAT'S AHEAD IN MINING** . . . p. 70

Wet Rotary Drilling for Bolting • Pump Control
New Continuous Belt Train • Pitch Development
Strip-Mining Pillar Coal • Trackless Mining

**COAL SHOW PREVIEW . . . pp 86-93**

# NO LOADING MACHINE

# *Waiting...*



## ...with MINE CARS

Just look at the one big difference between mine cars and a 'continuous' haulage system: *the time-out costs.* Repairs on mine cars are few, far between, and mostly quite inexpensive. Even more important—one car 'out' *doesn't stop your coal from moving!* If a car needs adjustment . . . onto a siding with it! Your loaders fill up the rest of the trip. Your men—all the way from the face to the tipple—keep normally busy. Your coal gets out *all* day . . . *every* day . . . when you use a complete mine car system. You *keep* the loading machines busy! American Car and Foundry Company, New York · Chicago · St. Louis · San Francisco · Washington · Philadelphia Cleveland · Pittsburgh · Huntington, W. Va. · Berwick, Pa.

a.c.f.

**DROP BOTTOM**

**MINE CARS**

*for Constant Haulage*

*Visit*
**Booth 1523**
at the
**COAL SHOW**
CLEVELAND
MAY 14-17

# Only with B. F. Goodrich grommet belts can you make these savings!

## *Save 3 ways! Investigate today! Write or mail coupon*

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommets by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

### *What is a grommet?*

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

### *All cords put to work*

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

### *Better grip, less slip*

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

### *Send for proof*

Send the coupon for a set of reprints telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

"... within a few days ordinary belts had stretched ... After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 5 or 6 weeks ... B. F. Goodrich grommet belts are in their sixth month of service ..."

"Previous belts suffered from shock loads, wore out fast ... BFG grommet belts have been in service 2 years with no shut-downs..."

There are hundreds of cases like these.

### *They cost no more*

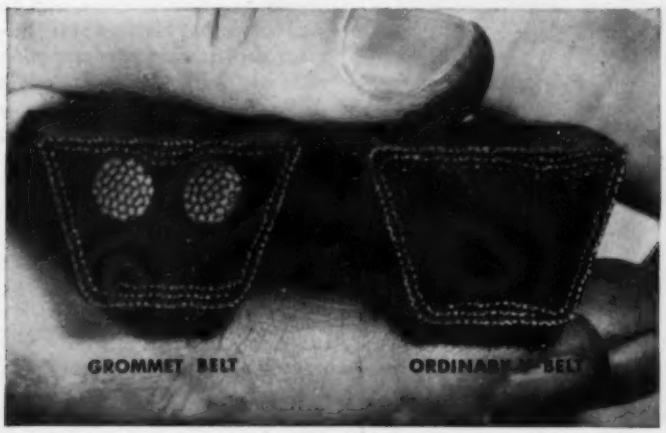
BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

*Grommet Belts* BY

**B.F.Goodrich**

FIRST IN RUBBER




**The B. F. Goodrich Company**
**Dept. CA-5**
**Akron, Ohio**

☐ Send set of reprints telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

Name_____

Firm Name_____

_____

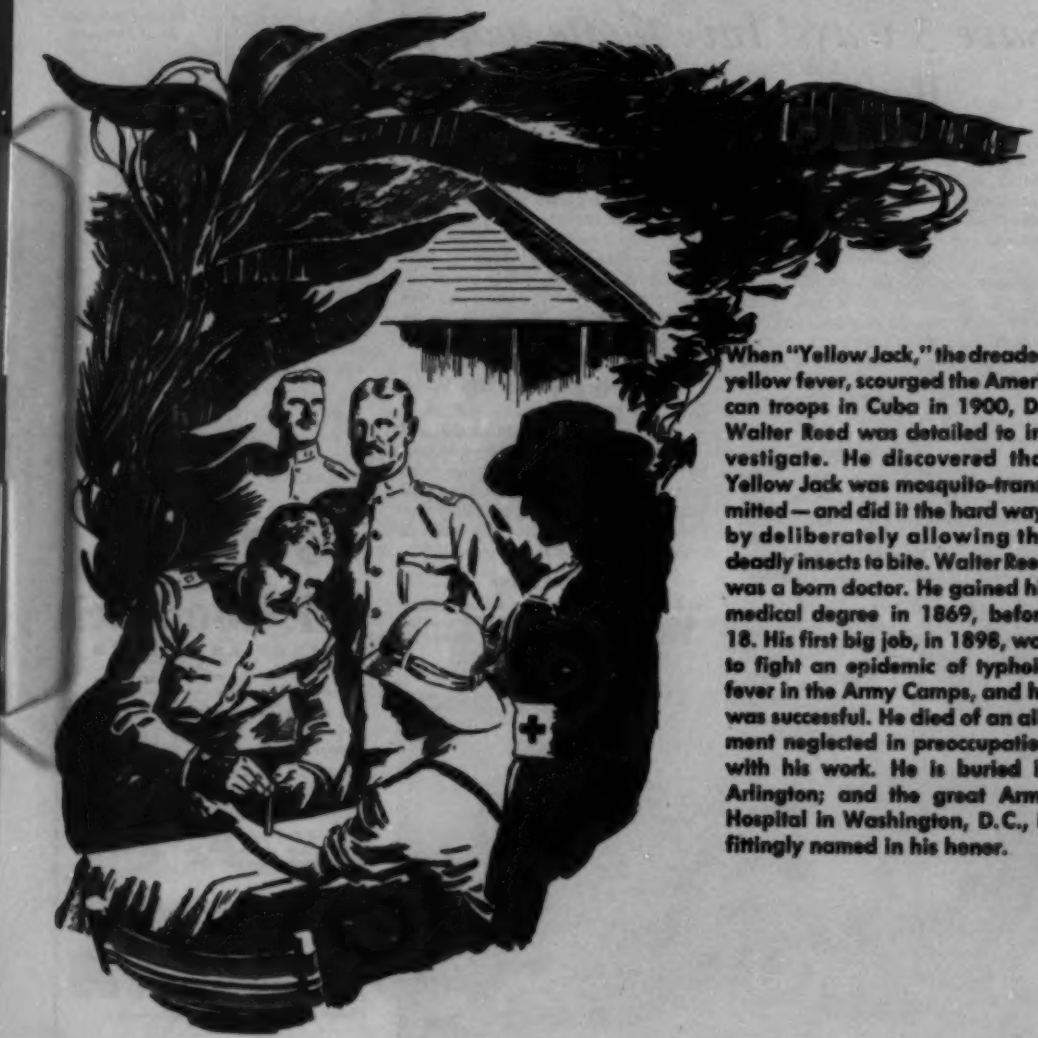
Street Address_____

City_____

State_____

# The Champion

## He licked "Yellowjack" and saved the U.S. Army —



When "Yellow Jack," the dreaded yellow fever, scourged the American troops in Cuba in 1900, Dr. Walter Reed was detailed to investigate. He discovered that Yellow Jack was mosquito-transmitted — and did it the hard way, by deliberately allowing the deadly insects to bite. Walter Reed was a born doctor. He gained his medical degree in 1869, before 18. His first big job, in 1898, was to fight an epidemic of typhoid fever in the Army Camps, and he was successful. He died of an ailment neglected in preoccupation with his work. He is buried in Arlington; and the great Army Hospital in Washington, D.C., is fittingly named in his honor.

**HULBURT OIL & GREASE COMPANY, PHILADELPHIA, PA.**

*Specialists in Coal Mine Lubrication*

# The Champion

## ...IN COAL MINE LUBRICATION

# Hulburt Quality GREASE

"The Champion"

**When coal mining machines get sick and won't run right—the name of the "bug" that's generally the cause is "friction"—and he breeds in faulty lubrication and the wrong kind of grease. And the one sure cure is HULBURT QUALITY GREASE. That's because this Grease is not a "cure-all" for all kinds of machinery. It is made solely for use in coal mining machinery, with a Quality of composition that peculiarly fits it to the difficult conditions down in coal mines. A Hulburt Lubrication Engineer is like a doctor . . . he not only prescribes the right grease for your conditions, but will tell you what's wrong and how to use this Grease to correct it.**

Maintenance cost is almost unbelievably low, with Bird Coal Filters — averages under 2 cents per ton and is frequently under 1 cent per ton.

PHOTO BY TORKEL KOHLING

# CAN YOU DRY YOUR FINE COAL FOR AS LITTLE AS A NICKEL PER TON?

That's what the BIRD COAL FILTER is doing in many preparation plants and even on the toughest jobs cost per ton is well under a dime.

Results in terms of coal dryness and water clarity are better than you can get from any other mechanical equipment or combination of equipment — at from one quarter to one third the over-all operating cost, including labor, power, maintenance, amortization, everything.

Before you invest in apparatus of any sort for dewatering your fine coal, get the story on the Bird Coal Filter.

## BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

### THIS MONTH'S COVER

TYPICAL OF THE NEW MACHINES being relied upon to reduce mining cost and improve the industry's position in the future is this continuous miner. For a review of significant developments in machines and methods see "What's Ahead in Coal Mining," leading off this issue of *Coal Age*.

### COMING IN THE FUTURE

- **Mining Progress**—Design for low cost and high quality in building a modern high-tonnage mining operation; results attained with a new technique of mining rooms 2,000 ft long.
- **Preparation**—How the Kemmerer Coal Co. improves its product by air removal of high-ash fines.
- **Haulage-Trends in Bituminous Deep Mines**—What USBM figures show.
- **Pumping and Drainage**—Aluminum pipe in low coal; turbine-pump advantages and use.
- **Training of Supervisory Personnel**—How Edward A. Lynch, director of personnel, Philadelphia & Reading, sees the problem, with particular reference to getting the most out of meetings.
- **Ventilation and Electrification**—Barometric surveying to improve ventilation; electrical safety devices and grounding.
- **Convention Report**—Watch for the complete report of the 1951 Coal Show appearing in June *Coal Age*. You'll find it a highly useful summary of the papers presented and the manufacturers' products exhibited.

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COAL AGE  MAY, 1951
VOLUME 56  NUMBER 5
(with which are combined The Colliery Engineer and Mines and Minerals)

Published monthly on the 1st by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948). Founder. Member ABC and ABP. Publication Office: 1309 Noble St., Philadelphia 23, Pa.
Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N. Y. Curtis W. McGraw, President; Willard T. Chevalier, Executive Vice President; Joseph A. Gerardi, Vice President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice President and Director of Advertising; J. E. Blackburn Jr., Vice President and Director of Circulation.
Subscriptions: Address all correspondence to COAL AGE—Subscription Service, 1309 Noble St., Philadelphia 23, Pa., or 330 W. 42nd St., New York 18.

Member of Associated Business Publications and Audit Bureau of Circulations

N. Y. Allow 10 days for change of address. Please indicate position and company connection on all subscription orders.
Single copies: U. S. and possessions and Canada, 50c; all other countries, $1.50.
Subscription rates: United States and possessions, $5 for one year, $8 for two years, $10 for three years. Canada and Pan-American countries, $6 for one year, $10 for two years, $15 for three years. All other countries, $13 for one year, $20 for two years, $30 for three years.
Entered as second class matter Aug. 27, 1942, at the Post Office at Chicago, Ill., under the Act of Mar. 3, 1879, pending transfer as second-class matter to the Philadelphia, Pa., Post Office. Printed in U. S. A.
Contents Copyright 1951 by McGraw-Hill Publishing Co., Inc.—All rights reserved. COAL AGE articles are indexed regularly by Engineering Index, Inc. COAL AGE'S own index published annually may be had on request to the Editorial Department.
Branch Offices and District Managers: Atlanta 3, R. C. Maultsby; Chicago 11, G. J. Cusak; Cleveland 15, W. M. Spears; Dallas 1, J. H. Allen; Los Angeles 17, C. W. Dysinger; New York 18, T. R. Aikens and S. Kennedy (New York and New England); Philadelphia 3, W. A. Potter; Pittsburgh 22, H. C. Chellson; St. Louis 1, F. W. Smith; San Francisco 4, J. W. Otterson; Boston 16; Washington 4; Aldwych House, Aldwych, London W. C. 2.
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Load your "guns" with TEXACO OLYMPIAN GREASE

**VISIT TEXACO**
**at the**
**COAL SHOW**
**in Cleveland**
**May 14-17**
**BOOTHS 2312-14**

TUNE IN... TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

TEXACO

**TEXACO LUBRICANTS**

WHEN *Texaco Olympian Grease* goes into car wheel bearings—plain, cavity hub or anti-friction—you can be sure of easier starts and lower bearing maintenance costs the year 'round. And these are the reasons why—

*Texaco Olympian Grease* stays *in* the bearings to give longer lasting, more effective protection. It seals out dirt and moisture . . . resists oxidation and separation both in service and in storage . . . reduces wear. You can get *Texaco Olympian Grease* in three consistencies to meet all your requirements.

For your hydraulic mechanisms, above or below ground, the best assurance of uninterrupted operation is *Texaco Regal Oils (R&O)*. These turbine-quality hydraulic oils will keep rust, sludge and foam out of hydraulic systems . . . assure smoother operation . . . prolong pump life and reduce maintenance costs.

Let a Texaco Lubrication Engineer give you full details . . . and help you simplify lubrication and reduce costs throughout your mine. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

# For the Coal Mining Industry

# Here's what WE mean by

**The new Allis-Chalmers tractors are not merely new models incorporating refinements of existing ideas . . . they are *new from the ground up* . . . without compromise anywhere in design or material.**

**They are the answer to your demands for tractors that will give you outstanding performance on a variety of applications—whatever those jobs may be.**

**Behind the design are your own ideas . . . and those of your operators and mechanics . . . combined with the vast experience of Allis-Chalmers.**

**Check the following outstanding features . . . then get the full story from your Allis-Chalmers dealer on this—"THE FINEST TRACTOR LINE ON EARTH."**

**POWER TO SPARE**—A large untapped reserve (up to 1/3 of peak available hp.) assures easier going on toughest work—longer engine life, less servicing. Morever, it has been proved that General Motors 2-Cycle Diesels are unmatched in lugging ability; they build up torque faster and higher . . . hold it longer.

**MATCHED POWER TRAIN ASSEMBLIES**—Each and every part of the power train—from master clutch to final drive—has more than enough capacity and strength to handle any load it was ever meant to carry. Bigger clutches, booster steering, double-reduction final drives, all add life—get more work done.

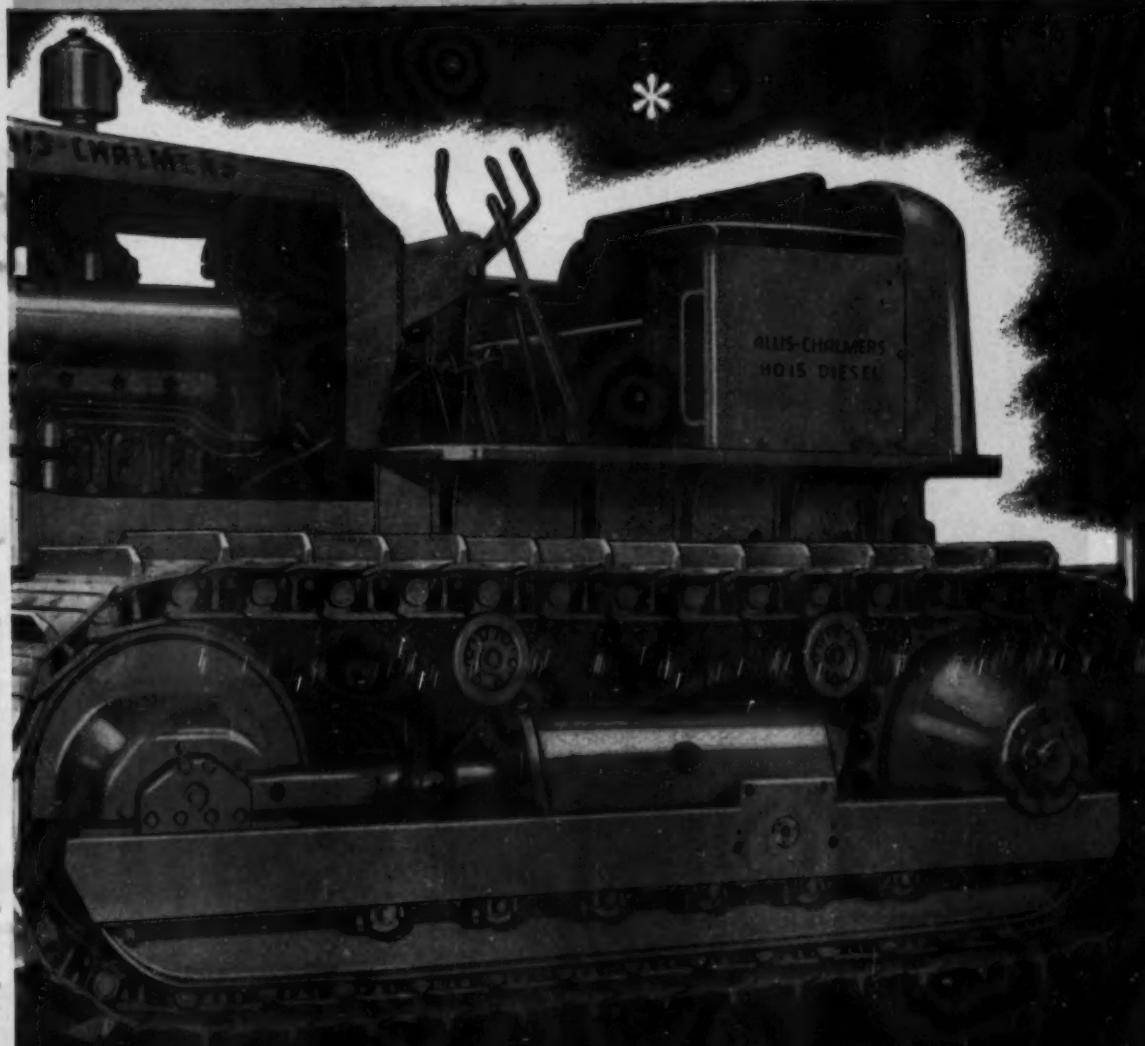
**REVOLUTIONARY SHIFT PATTERN**—A quick, one-lever shift from any forward speed to any reverse position saves shifting motion and time—smoother and easier, too.

**POSITIVE BALANCE**—Tractors work equally well with any equipment—drawn or mounted. There's *greater stability* and *traction* with more track on the ground and lower structural weight. Main and truck frames are heavier, truck frames longer . . . idlers are bigger, and both idlers and sprockets lowered . . . all steel construction throughout. Up to 50 percent more ground clearance!

**ALLIS-CHALMERS**

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

# DESIGNED FOR YOUR JOB




HD-5
40.26 drawbar hp.
11,250 lb.

HD-9
70 drawbar hp.
13,800 lb.

*
HD-15
102 drawbar hp.
27,850 lb.

HD-20
Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

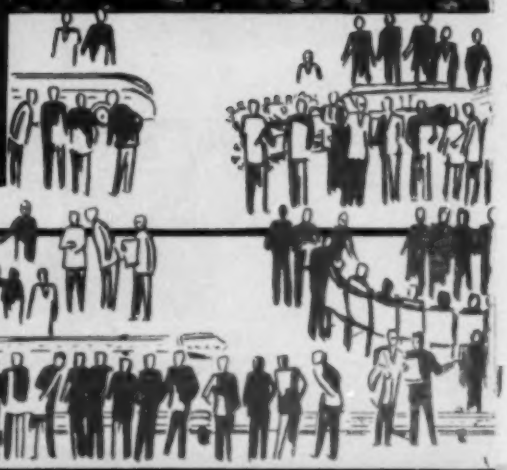
## *The Newest, Finest Tractor Line on Earth!*

• DESIGNED FOR YOUR JOB • BUILT TO "TAKE IT" • EASY TO OPERATE • EASY TO SERVICE

AT THE 1951

# All eyes will be on

SEE THESE NEW MACHINES
NEVER BEFORE EXHIBITED!



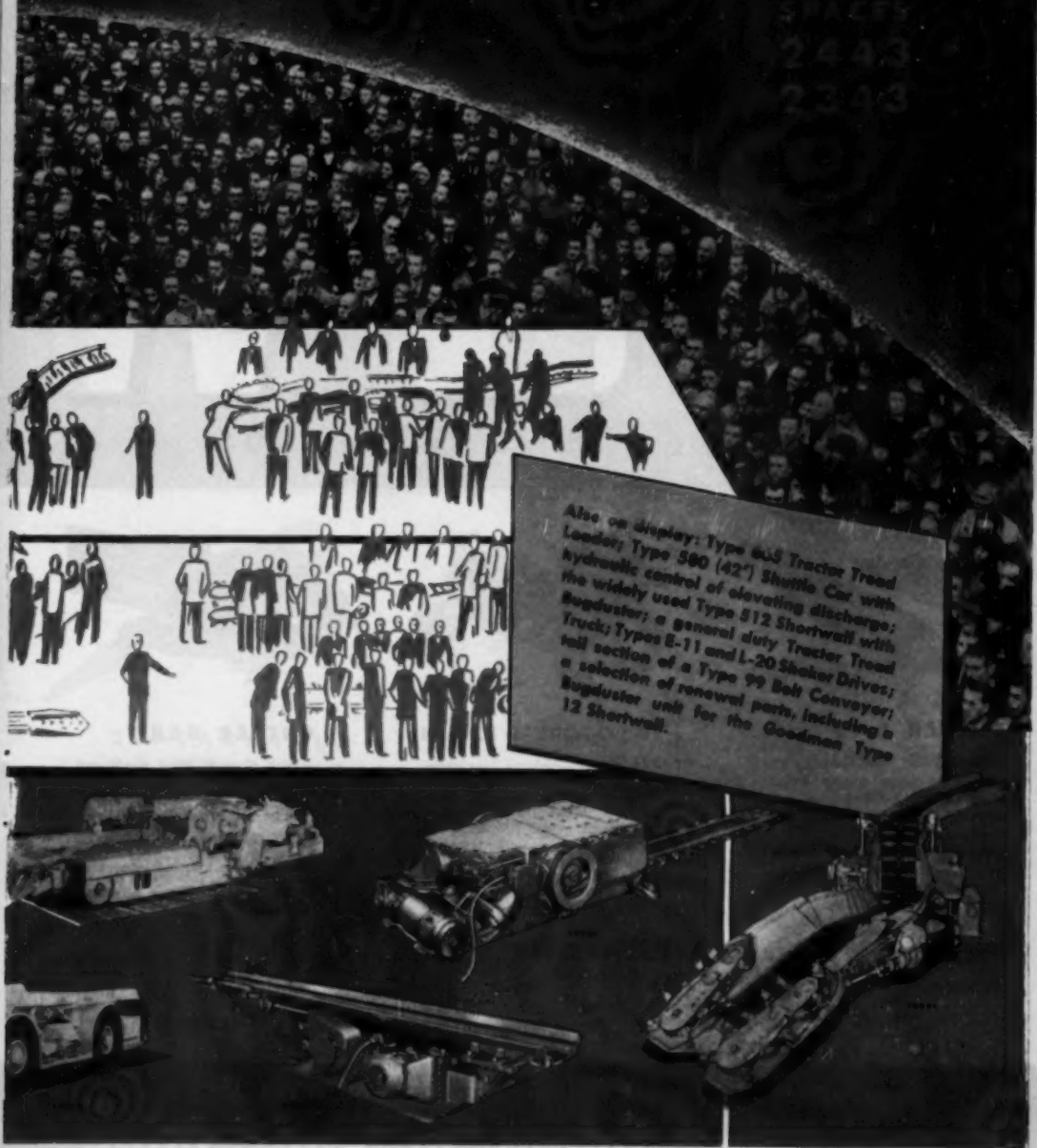


Goodman
MANUFACTURING
COMPANY

HALSTED ST. AT 48TH • CHICAGO 9, ILLINOIS

# COAL SHOW – Cleveland

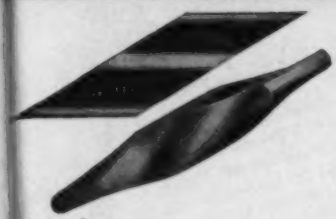
# *the Goodman exhibit!*



Also on display: Type 6US Tractor Treed Loader; Type 580 (42") Shuttle Car with hydraulic control of elevating discharge; the widely used Type 512 Shortwall with Bugdustor; a General duty Tractor Treed Truck; Types E-11 and L-20 Shaker Drives; tail section of a Type 99 Belt Conveyor; a selection of renewal parts, including a Bugdustor unit for the Goodman Type 12 Shortwall.

# BOW

AT THE SHOW—BOOTH 1006



## CUTTER BITS

—Heat-treated and specially designed for coarse cutting, Bowdil bits save power—save time—save money. Bowdil bits have 25% more wearing length. Actual operating records in hundreds of mines prove they last 15% to 20% longer than others.

## FABRI-FORGED CHAIN

—is rugged—requires less maintenance than other types. Chain circles cutter bar at correct angle because of Bowdil's true-running, radial track guide. Drop-forge lug body stands up under heavy wear—is built for many times the normal load. Chain is easy to connect, remove or replace.

## CUTTER BARS

—High physical alloy steels and rivet-free design give Bowdil bars their great strength. Made for coarse cutting, they save power—provide long, trouble-free service. Fit all standard cutting machines.

**FIELD MEN AND REPRESENTATIVES in** West Frankford, Illinois • Whitesburg, Kentucky • Charleroi, Pennsylvania • Denver, Colorado • Williamson, West Virginia

***Bowdil Equipment in your mine...***

# DIL

## REPLACEABLE POINT PICKS

—make it possible for miners to carry "extra picks in their pockets." Designed for ideal weight and balance, workers would still choose this pick—even without the special replaceable, heat treated points.

## NEW TRANSIT SUPPORT

For use in all types deep mining, especially efficient for conveyor mining. As rigid as a prop, sturdily constructed of aluminum and stainless steel Lightweight, easily, quickly sets up correct height for transit. Main column graduated on 2 sides in 1/100 foot.

## AUGERS & DRILL BITS

—are furnished in many sizes and styles. All are heat-treated, tough, and long-wearing. Correct auger design eliminates "grabbing." Fishtail, four-point, two-point, etc., styles assure you of the right bit for every job.

Big Stone Gap, Virginia • Canton, Ohio • Birmingham, Alabama • Centerville, Iowa
Helper, Utah • Kansas City, Missouri • Topeka, Kansas • New Castle, England

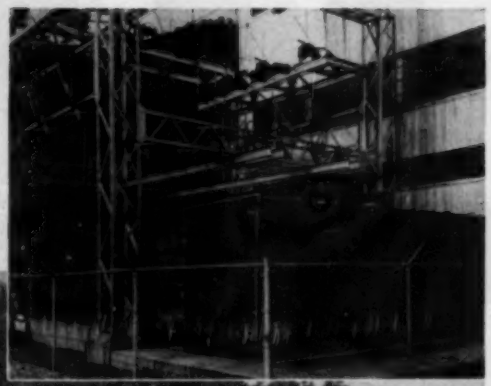
**THE BOWDIL COMPANY** **CANTON, OHIO**

***...brings profits out with the coal!***

# Electrically co-ordinated to keep clean-coal output at 750 tons per hour!

**New Price mine and preparation plant rely on General Electric equipment to maintain high operating efficiency**

**Completed in May, 1950,** the Price Mine preparation plant of the Inland Steel Co. at Wheelwright, Ky., makes extensive use of co-ordinated General Electric equipment to minimize outage and maintenance delay, keep clean-coal output at rated capacity of 750 tons per hour. Here, ash and other impurities in the mined coal are removed to provide a high grade metallurgical coal, uniformly low in ash, for making coke. A 3000-kva G-E package substation—including transformers and switchgear—contains all equipment needed to step down incoming 14,000-volt power and distribute it at 480 volts to power the plant's motors.



GENERAL ELECTRIC

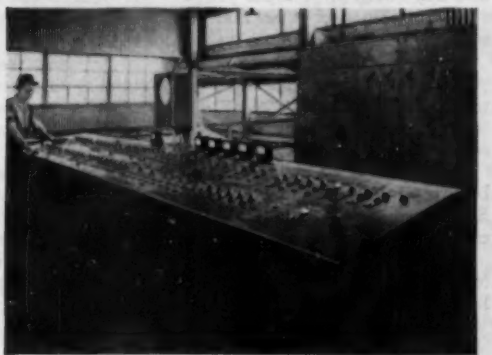
663-14

**2 To haul coal** from the underground assembly yard to the preparation plant over a 5-mile haulageway, 6 G-E 15-ton high-speed haulage locomotives are used, fully equipped with air brakes and air sanding, and controlled by air-operated contactors. Efficient, powerful, fast and safe, each locomotive makes 5 to 6 round trips per 7½-hour shift, handles 60 cars, each of 4¼ tons total gross weight.

**3 To convert a-c to d-c** needed for locomotives and other mining machinery, two G-E 300-kw 275-volt d-c rectifiers are used, one stationary and one portable. High in conversion efficiency, these units are easily installed, give high service continuity with minimum maintenance, and are metal-enclosed to protect personnel. Portable type shown is easily relocated to give near-full voltage at the face for more efficient machine operation, and to eliminate long, expensive d-c cable runs.

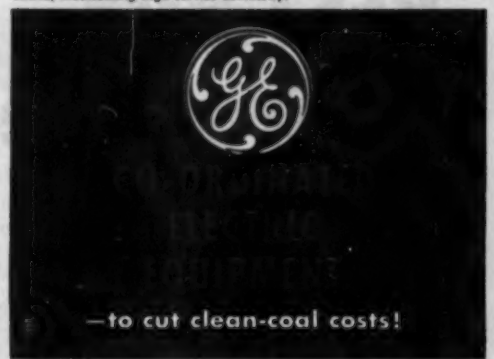
**4 Ventilation for the mine** is supplied by a 4-foot high-speed fan driven by this G-E 2-speed Tri-Clad* motor rated 50/12½ hp, 1175/585 rpm, 440 volts. Tri-Clad motors—with 3-way extra protection built in against physical damage, electrical breakdown, and operating wear and tear—are available in enclosures for every mining use. G-E automatic 2-speed control above motor protects fan against single-phase operation, overload, and other possible interruptions to this vital operation.

**5 From the washers,** after cleaning, ¼" x 0 coal is fed into 6 centrifugal dryers (four shown) driven by G-E wound-rotor motors rated 150 hp, 900 rpm, 440 volts. Plant uses a total of about 3600 horsepower. And with dependable G-E motors and control co-ordinated into a smooth-running, efficient, and low-maintenance operation, each step in the preparation process dovetails with all other steps, minimizing production slowdowns, maintaining high service continuity.



**6 Centralized control** of plant operations is provided by this G-E main control desk. Push buttons, selector switches and indicating lights are all conveniently combined and centralized at one location, to co-ordinate operations closely, make most efficient use of manpower. G-E Cabinetrol* unit in background, one of several located at control points, contains switch and fuse combination starters, plus interlocks and timers to provide sequence operation.

*Registered trade mark of General Electric Co.




**7 All G-E equipment** for this mine was supplied on a G-E project co-ordination basis. Find out how this plan can simplify your ordering, save your time, help your consulting engineers and contractors to provide a co-ordinated system to meet your needs. Ask your G-E representative to tell you all about this plan, and send for Bulletin GEA-5308, a 32-page photo report on how G-E is benefiting typical preparation plants. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

# What's the "BEST BUY" in Wire Rope ?

***LET YOUR RECORDS TELL YOU!***

The only way to determine a wire rope's value is to record the actual work it does . . . in terms of ton-miles, yards of rock moved, cars of coal hauled, etc. We'd like to have you keep such records on Bethlehem rope and any competitive ropes you may be using. Make a regular practice of it, so that you'll *know* how much each rope has done before it's scrapped.

At intervals, study these figures. They're your real yardstick of comparison. When you divide the purchase price of a rope by the total work it's done . . . expressed in tons, yards, or other units . . . the real cost of the rope becomes evident.

There's no truer method of determining today's best buy in wire rope. That's why we urge that you stack Bethlehem rope against the field and make your own comparisons—based on your own personal records.

Is there any better way of inviting you, the customer, to see for yourself? Is there any better, fairer way of laying our product right on the line?

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

"Second best" won't do—

# YOU NEED FIRST CHOICE TIRES!

*More tons are hauled on Goodyear tires than on any other kind* — a fact that is more important now than ever before.

Get Goodyears and you get the tires that cost-wise operators count on for long, dependable, trouble-free service.

**ROAD LUG**

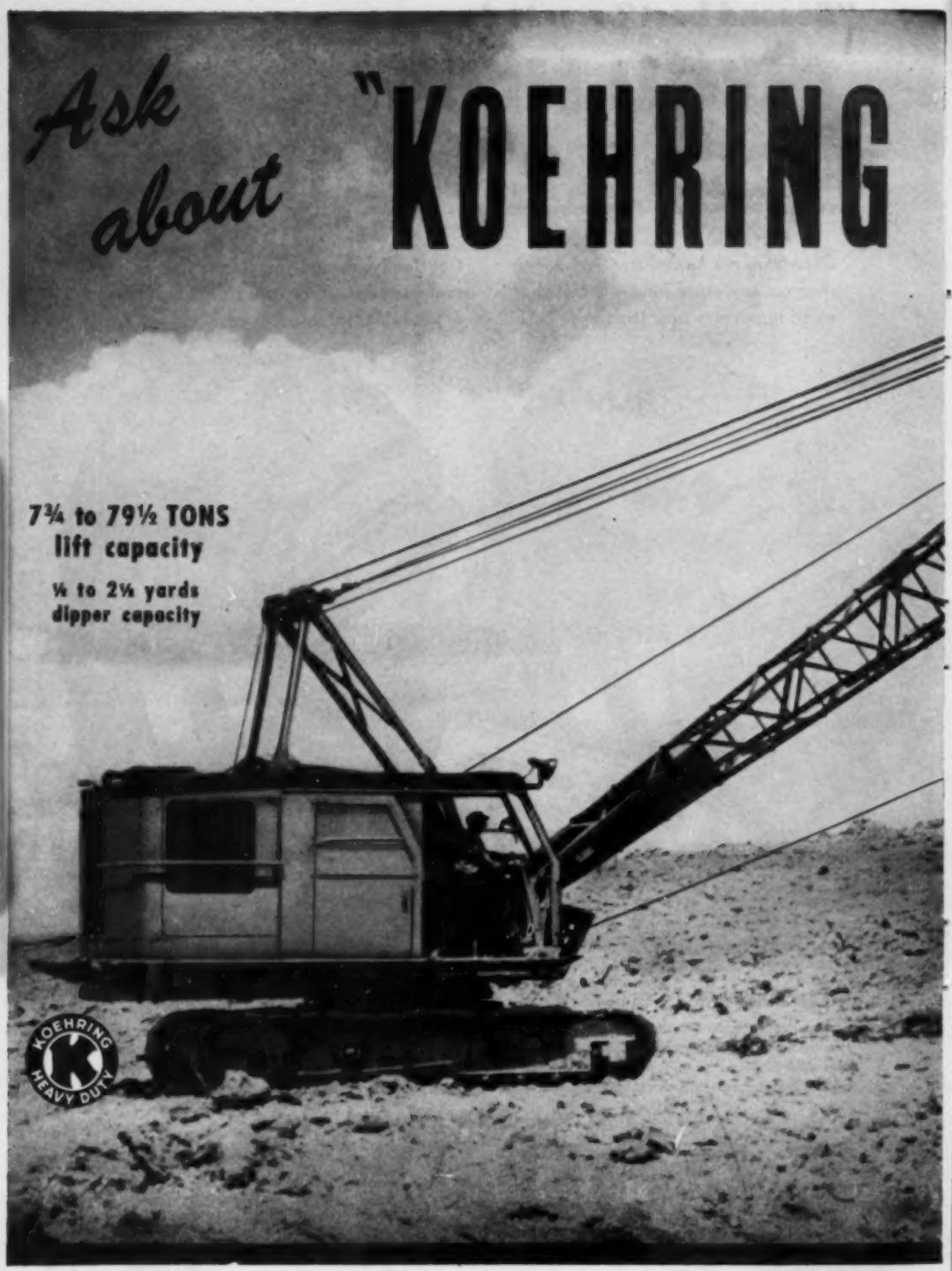
For trucks that operate both OFF and ON the road, this dual-purpose tire is best. Tough construction and special tread design provide super-traction off the road—long, smooth mileage on the road.

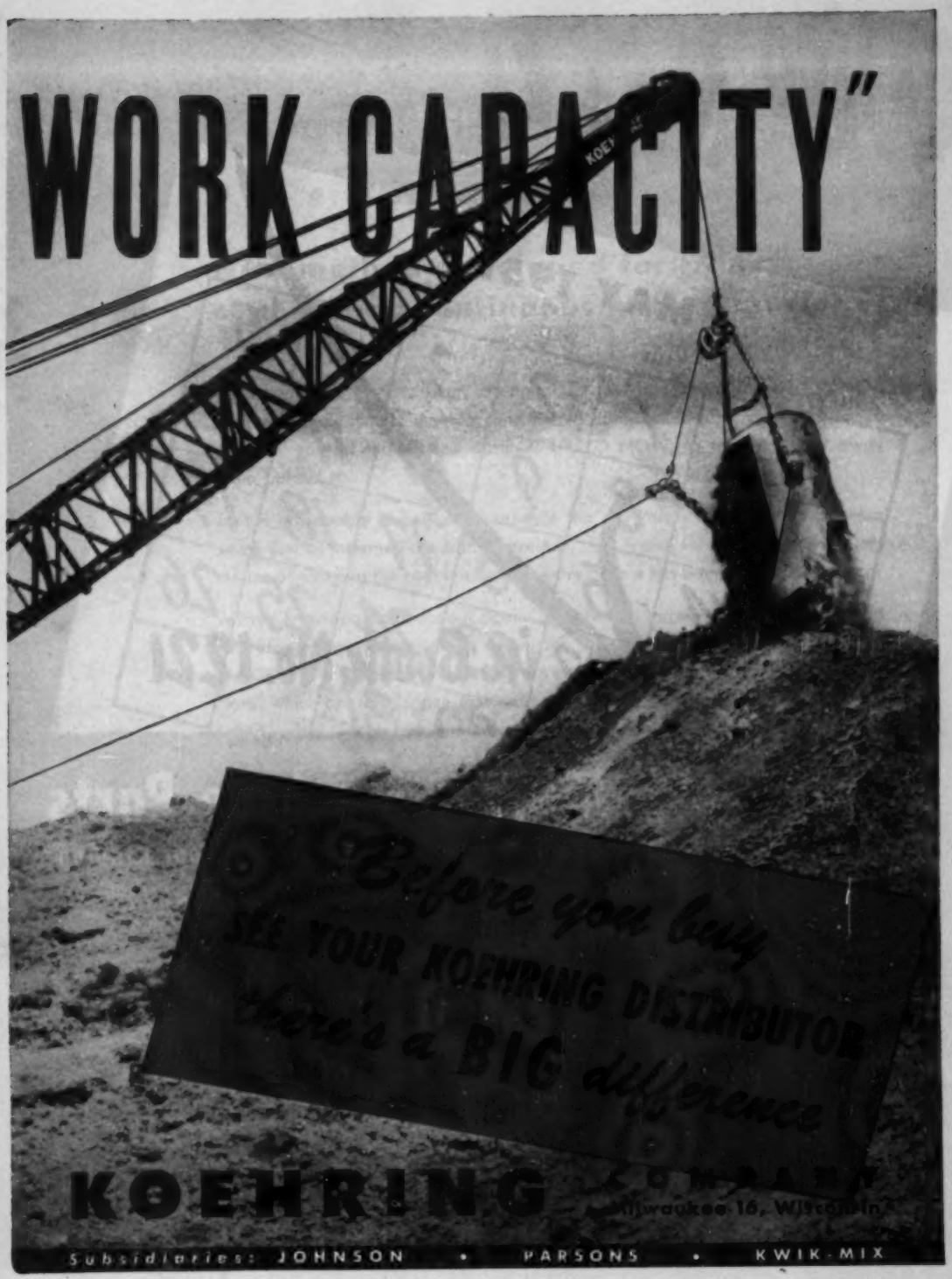
**HARD ROCK LUG**

For tire-bruising, heavy-duty off-the-road work, this super-rugged tire is tops. Its tough armored carcass and extra-husky lugs assure more wear, better performance no matter how tough the going.

GOODYEAR

Road Lug—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio


Ask about "KOEHRING
7¾ to 79½ TONS
lift capacity
½ to 2½ yards
dipper capacity
KOEHRING
HEAVY DUTY


WORK CAPACITY"
Before you buy
SEE YOUR KOEHRING DISTRIBUTOR
there's a BIG difference
KOEHRING
Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

# Will See You on

## Mining Machine Parts

*Repair Parts for Underground Coal Loading Equipment*

GENUINE MMP Parts

See the NEW MMP "Loadmaster" Universal Conveyor Chain

**MINING MACHINE PARTS INCORPORATED**

5707 ST. CLAIR AVENUE • CLEVELAND 3, OHIO

# IT'S HERE!

## • • • Real Continuous Mining

### New method developed for transporting coal behind continuous mining machines

For some time we have been talking about the rugged and mobile COLMOL, our continuous mining machine and its high production rate . . . how it mined the coal so fast that it was difficult, UP TO NOW, to take the coal away from behind it.

Isn't it reasonable to believe, then, that the next move would be to develop some sort of intermediate transportation . . . a rapid, flexible and satisfactory means of carrying the coal back to the entry once it has been mined at the face?

Jeffrey Engineers have done it again . . . followed through with a NEW method of transporting coal, providing means for taking it in a *continuous* stream from the COLMOL. It's the MOLVEYOR, a train of belts (made up of individual sections) which operate 'snake fashion' between the COLMOL and main transportation system . . . in entries, cross-cuts or rooms, and around one or more corners.

The MOLVEYOR *is* flexible and self-propelled—may be 300 feet or more in length. Study the drawing on the next page . . . Look at the various installation views of this unique COLMOL—MOLVEYOR set-up. Then, send for a Jeffrey Engineer.

Right—MOLVEYOR unit is sh
to the COLMOL and receivi
to be transported back to t
veyor.

# continuous flow of coal

## from face to entry . . .

Drawing depicts the flexibility of the MOLVEYOR. It shows how it may 'snake' around room necks while the COLMOL is advancing, removing all of the coal produced every minute—every foot of the way. NO MORE WAITING for intermediate transportation.

The MOLVEYOR trams at a rate of thirty feet per minute—in a train. However, each section has its own tramming motor and belt motor.

Study the drawing . . . it shows what can be done to complete the continuous mining chain.

Center view shows the MO
takes a circuitous route fro
to the entry.

Coal is discharged from th
to the mother conveyor (wi
The MOLVEYOR advances
all times discharging onto
conveyor.

nit is shown attached
receiving coal from it
ck to the mother con-

the MOLVEYOR as it
ute from the COLMOL

from the MOLVEYOR
yor (without spillage).
dvances or retreats, at
ng onto the mother belt

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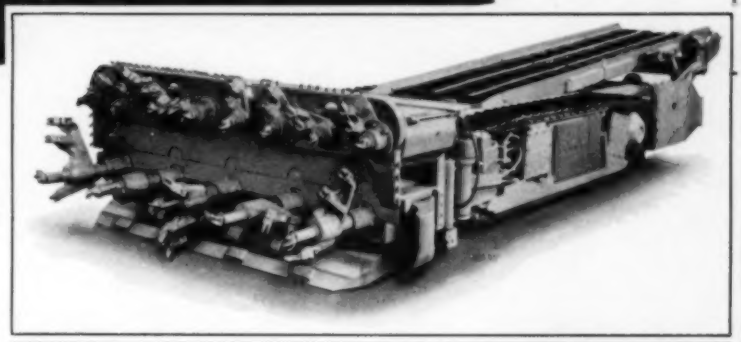
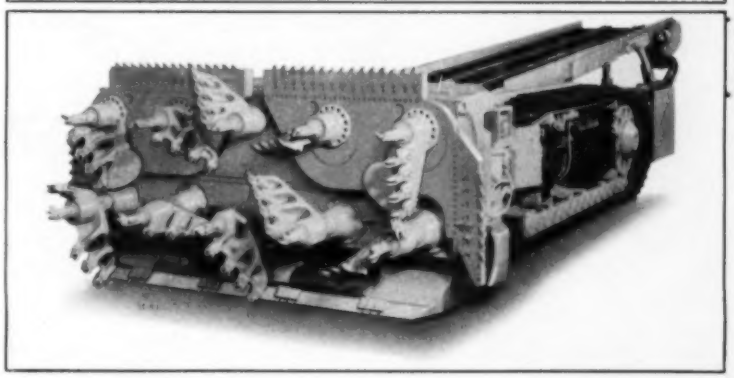


Jeffrey MM76-A COLMOL (low type) available in various heights: 32" to 44"; 38" to 50"; 42" to 54".



Jeffrey MM76-B COLMOL (high type) available in various heights: 45½" to 55"; 50½" to 66"; 56½" to 72" and up.

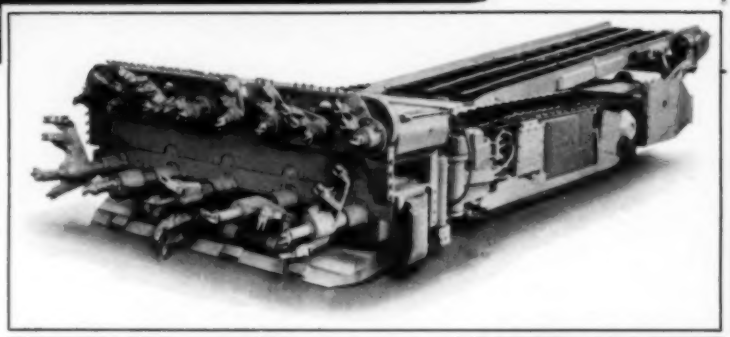
**The COLMOL, continuous mining machine, eliminates the need of three separate machines for cutting, drilling and loading. It advances continuously in solid seam of coal at the rate of 24" per minute or more, removing all coal from an area 9½ feet wide by 32 inches and upward. A rated capacity of 3 to 5 tons per minute. Completely hydraulic in action.**

**Send for Bulletin No. 834.**

**THE JEFFREY MANUFACTURING CO.**

*Established in 1877*

912 North Fourth Street, Columbus 16, Ohio



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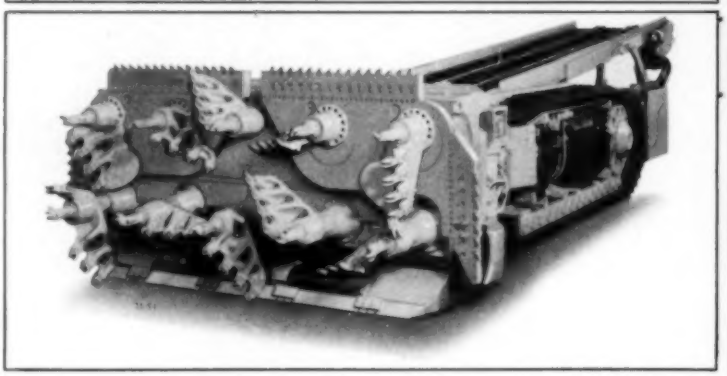

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912 North Fourth Street, Columbus 16, Ohio

# J&L STEEL

## *Operators Get Longer Service Life with . . .*

If you're responsible for the wire rope on clamshells, shovels or any other earthmoving equipment that operates on small diameter sheaves and drums, J&L CenterFit Wire Rope can help you save money.

CenterFit, produced exclusively by Jones & Laughlin Steel Corporation, has a unique design engineered to give you more steel and fewer voids than conventional wire rope. All strands run in the same direction with outside strands fitting snugly into the valleys between inside strands. The result—greater strength . . . easier handling . . . which means longer service life.

In addition J&L CenterFit is lubricated with BRONZ-LUBE, the exclusive J&L lubricant with high film strength that prevents squeezing out between the strands. BRONZ-LUBE contains fine flakes of soft bearing metal that provide a smooth wear-resistant surface for every wire—forms a close adherent coating that doesn't drip off unless subjected to extremely high temperatures.

Users' records prove that J&L CenterFit lubricated with BRONZ-LUBE reduces operating costs, diminishes downtime and increases profits when used in the applications for which it was designed.

**AND HERE'S HOW YOU CAN FIND OUT MORE ABOUT CENTERFIT WIRE ROPE!**

Just write to Jones & Laughlin Steel Corporation, 411 Jones & Laughlin Building, Pittsburgh 30, Pa., and ask for a free copy of our booklet, "CenterFit." It gives you detailed information on the construction and applications of this exclusive J&L wire rope and tells how others are saving money through its use.

## JONES & LAUGHLIN STEEL CORPORATION

*From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in* OTISCOLOY *and* JALLOY (*hi-tensile steels*).

**PRINCIPAL PRODUCTS:** HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

# FOR COMPLETE

# Ashland

## PERMATREAT COAL SPRAY

## IS PART OF THE

**Modern preparation plants are installing oil treating equipment as an integral part of their cleaning and washing plants. They find PERMATREAT the most efficient and economical method of dust-proofing and freeze-proofing all grades of coal.**

**Applied by pressure, as illustrated on opposite page, PERMATREAT coats every particle of coal as it leaves the chutes. In this installation, oil is heated to about 175 degrees. This allows it to atomize into a fine mist, reducing the amount required for thorough dust-proofing.**

**Ashland PERMATREAT will not wash off or lose its effectiveness in transit, in the stockpile or in user's bins.**

**Write for complete information or ask for one of Ashland's engineers, who will help you select the correct type and installation best suited for oil treating your coals.**

## VISIT US AT THE COAL SHOW

**Cleveland, Ohio — May 14-17**

**BOOTH 924—MAIN EXHIBIT HALL**

## ASHLAND OIL & REFINING

# PREPARATION

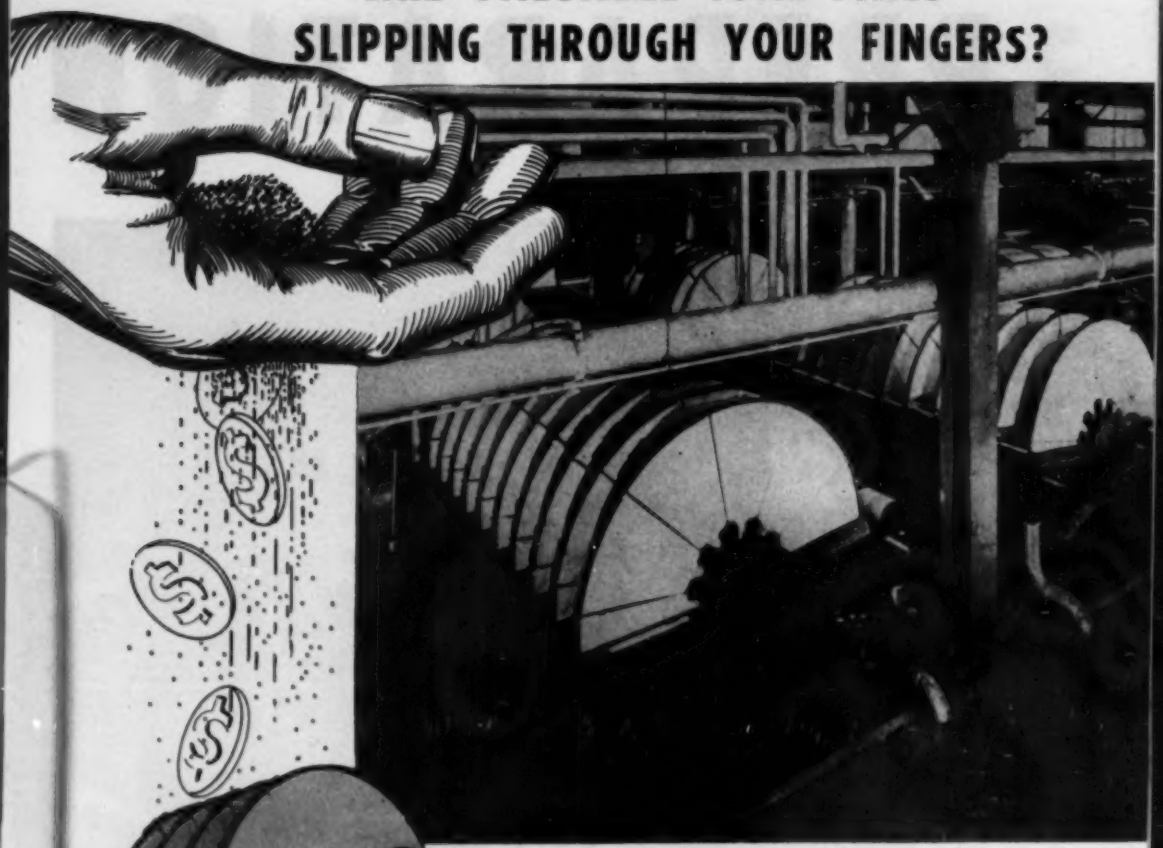
Photo of cleaning plant courtesy of Island Creek Coal Company . . .

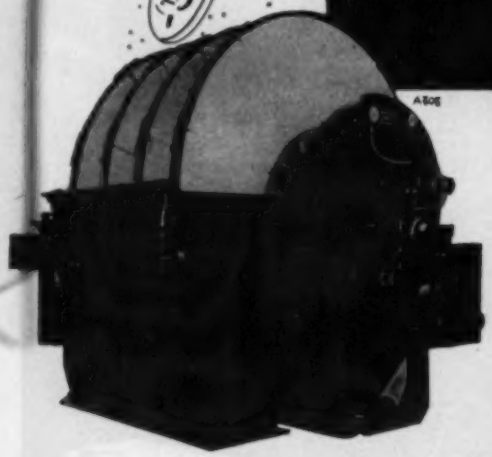
PICTURE

Ashland
PERMATREAT
COAL SPRAY

COMPANY... ASHLAND, KENTUCKY

# ARE VALUABLE COAL FINES SLIPPING THROUGH YOUR FINGERS?





**Coal fines can be a profitable item when dewatered on an Eimco Filter. Fast separation with efficient drying assures users of maximum production from each square foot of filter area.**

**Eimco will produce a clear filtrate which will not be objectionable in States where anti-pollution laws exist.**

**As a free service to companies considering the use of coal saving equipment we invite you to send samples to our complete filtration laboratory for a test in filterability — write for shipping instructions.**

**It will be a privilege for an Eimco engineer to consult with you on filtration problems.**

EIMCO

THE EIMCO CORPORATION

*The World's Largest Manufacturers of Underground Rock Loading Machines*

EXECUTIVE OFFICES AND FACTORIES – SALT LAKE CITY 10, UTAH, U. S. A.

*BRANCH SALES AND SERVICE OFFICES:*

NEW YORK, 51-53 SOUTH STREET • CHICAGO, 3319 SOUTH WALLACE STREET
BIRMINGHAM, ALA., 3140 FAYETTE AVE • DULUTH, MINN., 216 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIFORNIA, P. O. BOX 240
KELLOGG, IDAHO, 507 DIVISION STREET

IN FRANCE: SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND: EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

*You can't beat an Eimco!*

# JOY S.P.B.* CONNECTORS

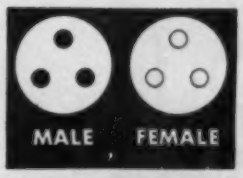
FOR PRICES SEE JOY PRICE SHEET 5214-2

*JOY Straight Pin Bigun (S.P.B.) Connectors are built for rough everyday service. Equipped with rust-proof threaded metal coupling (see cut-away sketch) and the famous JOY two-way water seal, they can't be surpassed for performance, safety and durability . . . and because they're molded to cable as one-piece Neoprene units, they're shatter-proof, wear-resistant and highly impervious to the deteriorating effects of moisture, grime or oils. Through them power cable can be sectionalized into easily handled lengths that facilitate rapid replacements of damaged sections.

Available for A.C. or D.C. operation in current capacities to match job requirements. Choice of one through four conductors with choice of contact arrangements illustrated and described below.

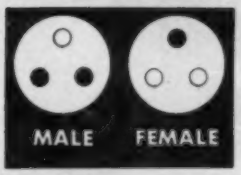
## *Choice of 4 Contact Styles*

**Rated at 600 volts maximum**



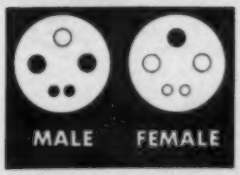

STANDARD PIN PLACEMENT

Available in single conductor design for wire sizes 14 through 1000 MCM . . . and in two, three or four conductor styles for wire sizes 14 through 4/0.



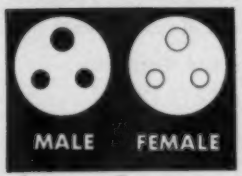

REVERSED PIN PLACEMENT

All contacts same size, however, one contact reversed in Male and Female plugs for grounding and polarization. Available in three or four conductor styles for wire sizes 12 through 250 MCM.




PILOT PIN DESIGN

Same number of conductors and wire sizes as listed above for reversed pin placement series, however, have two additional small "pilot-control" contacts. Supplied with these contacts shunted or carried through cable on two #10 wires.

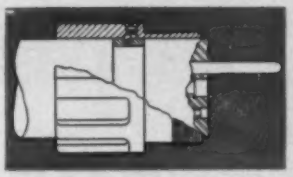



ENLARGED PIN DESIGN

Supplied with one larger contact on Male and Female plugs for grounding and polarization. Available in three or four conductor styles for wire sizes 12 through 250 MCM.

*Consult a Joy Engineer*

Ask him for a copy of Bulletin RV 106 on JOY Cable Vulcanizers, too.

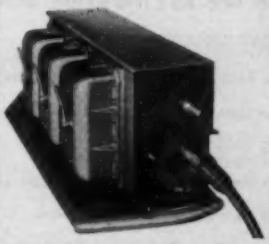


S.P.B. CONNECTORS are easily engaged or disengaged. Threaded "fire-hydrant-type" couplings quickly and positively connect or disconnect (see sketch for details) Couplings on larger size connectors equipped with ball bearings. Damaged couplings quickly replaceable from factory stock.

PROTECTIVE NEOPRENE SLEEVE—Available for S.P.B. Connectors 2" or over in diameter. Fits over metal couplings on female style connectors. Protects exposed male threads. Will not interfere with coupling or uncoupling procedure.

## SAFETY CIRCUIT CENTERS

FOR PRICES SEE JOY PRICE SHEET No. 5225-2



No. PGGK—PERMISSIBLE STYLE THREE OUTLET S. C. C. ILLUSTRATED

Ideal for all mechanized mining power transmission systems, Joy SCC's are supplied with 1, 2, 3 or 4 outlets in A.C. or D.C. current ratings to match any need. Fully protect personnel and equipment; permit power delivery through minimum lengths of sectionalized cable. Available in two styles (Permissible and Dust Resistant) both equipped with fast-acting circuit breakers. No fuses, tools or extra parts required to restore power after correcting a fault in cable. Supplied with or without pilot control circuits.

WAD ME5465

# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# CUT LUBRICATION with this ONE

*"Using LITHOLINE® saves several greases and guns!"*

**Now you can do all lubricating jobs just as well *if not better* with one grease and one gun, using Sinclair LITHOLINE.**

**Using Sinclair LITHOLINE is the modern, fool-proof, money-saving way to handle all your lubrication jobs. LITHOLINE converts servicing time into production time.**

## ADVANTAGES OF LITHOLINE over specialized greases:

- SUPERIOR LUBRICATION AT EVERY POINT
- No danger of costly misapplication
- Quicker servicing, less downtime
- Smaller grease inventories
- Fewer dispensing units
- Less chance of contamination
- Less waste
- Simplified purchasing and distribution

**Send for free folder describing demonstrations showing the superiority of LITHOLINE. Write to your nearest Supplier of Sinclair Products or direct to Sinclair Refining Company, 630 Fifth Avenue, New York 20, N.Y.**

**SINCLAIR**

# COSTS ALL-PURPOSE GREASE

Litholine stays put in WATER PUMPS

WHEEL BEARINGS are safe with Litholine

Litholine for lasting CHASSIS lubrication

Litholine is top quality for UNIVERSAL JOINTS

LITHOLINE for every lubrication job

# Which for your mine?

**See Our Exhibit at the Coal Show in Cleveland—Booths 2338 to 2350**

## COAL RECOVERY DRILL

Designed to salvage profitable tonnage where overburden removal has become too costly for further stripping. Cardox-Hardsocg Augers, available in diameters of 20" to 40", carry the coal in a continuous flow from the seam. Illustration above shows "hook-up" with portable conveyor for automatically loading trucks or cars.

## CARDOX-HARDSOCG

Standard Drilling Equipment

The Cardox-Hardsocg line of proven drilling equipment features Carbide Tipped and Standard Cutterheads, augers ranging from 2" to 8" in diameter, bits, wedges, thread-bars, sockets, boxing and boxing liners.

Cardox-Hardsocg Carbide Tipped Cutterheads are available with recessed core breaker as shown, or extended pilot, and with spline, square or hexagon connections.

*Write for* descriptive bulletins of operating details and ASK FOR a free survey by a Cardox Corporation engineer.

# CARDOX CORPORATION

BELL BUILDING • CHICAGO 1, ILLINOIS

# CARDOX

## *One of these methods will cut your operating costs!*

[redacted]— brings to any coal mine a powerful new force [redacted] harp hammer-blow of explosives. This gentle [redacted] improve your operation whether you get it [redacted] or *Airdox*—but which of these is best suited to the [redacted]ions of a given mine is a technical decision for our engineers in conference with yours.

*Airdox* is a special application of compressed air power. *Cardox* employs the great force of expanding carbon dioxide. Methods of use at the face are generally similar. Naturally both are widely accepted for their greater safety* which permits on-shift use.

**Among the hazards eliminated by Cardox Non-Explosive Mining Methods is detonator caps found in coal after delivery to plants. Frequently cases of this kind are reported in the news—one specifically where a series of fires in coal pulverizer units resulted from this cause.*

## Both AIRDOX and CARDOX give you

The comparatively gentle heaving action results in more premium size coal in every ton mined and freedom from shatter cracks that cause costly degradation. That means more salable coal that is EASIER to sell.

Either method dislodges coal with a piston-like action concentrated at the *back* of the drill hole, where it is most effective. No smoke, flame or fumes accompany the fall—and very little dust.

# R&S COMPANY COAL SHOW NEWS

## "PROMISES TO BE BEST SHOW EVER HELD" says F. E. MUELLER

In a recent interview F. E. Mueller, president of Roberts and Schaefer Company, Chicago, predicted that the 1951 Coal Show will be the biggest and best ever held, from the standpoint of attendance, quality and scope of meetings to

F. E. MUELLER

be presented, as well as from the standpoint of modern methods and machines to be displayed.

Not since World War II, he said, has there been such a challenge to the Coal Industry to increase its productive efficiency and never has any meeting given promise of so many answers to that challenge as the 1951 Coal Show.

## COUNTER-CURRENT HEAVY-MEDIA SEPARATOR FEATURE OF R & S EXHIBIT

To be demonstrated at the Roberts & Schaefer exhibit will be a 3' x 6' Hardinge Counter-Current Heavy-Media Separator unit. The unit was constructed for use in the new R&S testing plant at Harvey, Illinois, and will be shipped there immediately after the Show. No "toy," this is an actual, operating machine. Though the first one to be used in the bituminous coal industry, it employs principles already proved successful in iron ore separation.

Roberts and Schaefer Company is exclusive licensee for the Hardinge Counter-Current Heavy-Media Separator in the bituminous coal industry.

## NEW R & S PREPARATION BULLETINS BEING READIED FOR COAL SHOW

New R&S bulletins, with considerable new information, are being prepared for release at the 1951 Coal Show. In addition to an 8-page bulletin featuring Wet Washing and an 8-page bulletin on Air Washing Large and Small Sizes, there will be a 16-page bulletin, "Preparation Parade," featuring outstanding new preparation plants. Whether you attend the Coal Show or not, you can get a set of these new bulletins as soon as they are off the press by addressing your request to Roberts and Schaefer Co., 130 N. Wells St., Chicago 6, Illinois.

## WILLIAM C. McCULLOCH to DISCUSS NEW AIR CLEANING PRACTICES AT SHOW —

As part of a panel on coal preparation problems and solutions at the 1951 Coal Show, Wm. C. McCulloch, R&S Preparation Manager, will discuss current practices in air cleaning of coal.

The following authorities will discuss related subjects as part of the same coal preparation panel: Byron Bird, Jeffrey Manufacturing Co. (Wet Cleaning Fine Coal); David R. Mitchell, Penn State College (Coarse Coal Cleaning); James Hannigan, Glen Alden Coal Co. (Cleaning Small Sizes of Anthracite); and F. P. Calhoun, Rochester & Pittsburgh Coal Co. (Related Problems of Mechanical Coal Cleaning).

D. E. MORGAN

## R&S INTERNATIONAL REPRESENTATIVE TO ATTEND CLEVELAND COAL SHOW

David E. Morgan, international representative for Roberts and Schaefer Company, will be at the 1951 Coal Show and available part time to answer questions concerning his recent 7-month tour of coal and metal mines in England, Belgium, France, Tunisia, Morocco and Sardinia. As the R&S contracting engineer, Mr. Morgan recently played a central part in the engineering of a modern preparation plant for the Government of Italy on the island of Sardinia, off the coast of Italy.

R. J. LOFQUIST

## RALPH J. LOFQUIST TO ANSWER HYDROGENATION QUESTIONS AT R & S BOOTH

Mining people interested in the preparation of coal for hydrogenation to convert it to gasoline and other liquid fuels will be able to discuss the subject with Ralph. J. Lofquist at the R&S booth. As the Roberts and Schaefer contracting engineer for the preparation plant at the Bureau of Mines pilot project at Louisiana, Missouri, Mr. Lofquist is familiar with overall hydrogenation considerations and is especially informed as regards coal preparation requirements. Mr. Lofquist's story of the hydrogenation plant generated considerable interest when published in a leading industry publication as well as when presented in a recent talk before a coal industry group, and it is anticipated that answering questions will keep him busy throughout the length of the show.

## KEY PERSONNEL TO STAFF BOOTH

According to present plans, the following R&S executives will staff Booth No. 2000 at the 1951 Coal Show in the Cleveland Auditorium: Frank E. Mueller, J. E. Kalinka, R. T. Middleton, R. E. Sloan, E. C. Carris, W. C. McCulloch, R. G. Miller, R. G. Miller, Jr., R. J. Lofquist, Raymond Wagner, Laning Dress and W. W. Blood. Mr. R. J. Russell, secretary of the Hardinge Company, will also be in attendance. Other personnel may be announced prior to May 14, opening date of the show.

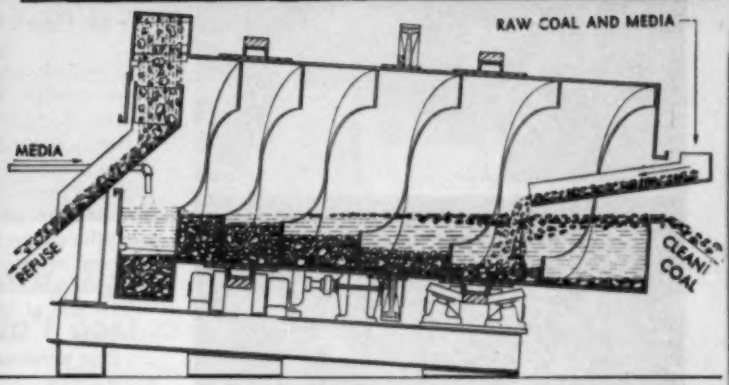
**ROBERTS & SCHAEFER COMPANY**

**BOOTH 2000 AT THE 1951 COAL SHOW**

# Announcing the appointment of ROBERTS & SCHAEFER Company as exclusive licensees in the Bituminous Coal Industry

FOR THE

HARDINGE COUNTER-CURRENT HEAVY-MEDIA SEPARATOR




The fast, efficient removal of refuse from coal is of paramount importance today. Particularly desirable is equipment that will provide maximum selectivity . . . the hair-line separation of near-gravity coal from near-gravity refuse.

We, therefore, feel that we are extremely fortunate in being able to offer the Hardinge Counter-Current Heavy-Media Separator to the Bituminous Coal Industry. This modern equipment is remarkably efficient and offers important savings in both time and money. It is the result of many years of experience in the design and manufacture of various types of separators and classifiers and embodies many worthwhile advantages. Its operation is exceedingly simple. Separation is precise over a broad gravity range. It will handle large and varying amounts of refuse and provides for wide variations in feed rate. Units are available in sizes and capacities to meet practically any requirements.

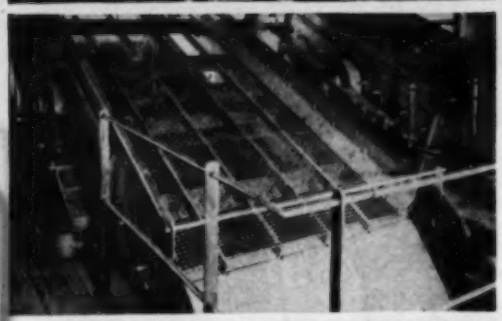
You will of course want to know more about the Hardinge equipment so write today for full details and descriptive literature.

The Heavy-Media Separation Processes are licensed by the American Zinc Lead and Smelting Company, American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N.Y., are their sole technical and sales representatives for these processes.

ROBERTS & SCHAEFER Company

130 North Wells Street, Chicago 6, Illinois
1314 Henry W. Oliver Bldg., Pittsburgh 22, Pa.
254 West 54th Street, New York 19, N. Y.
P. O. Box 570, Huntington 10, W. Va.

FOREIGN DEPT.: International Mtg. & Equipment Co., Inc.
220 Broadway, New York 38, New York, U. S. A.



# SCREEN IT ACCURATELY

# SCREEN IT ECONOMICALLY

**—on Hewitt-Robins Vibrating Screens**

You need closest possible control of sizes. You need lowest possible cost per ton. You can get both by putting the right vibrating screen on the job.

Here's where Hewitt-Robins can help. We introduced the circle-throw principle. We originated the elliptical throw. Today, we make vibrating screens in a wide range of types and kinds . . . handling everything from 9,000 lb. rocks to tiny specks . . . to perform every operation from scalping through sizing to dewatering.

The line of Hewitt-Robins Vibrating Screens is complete . . . ranging from 16" x 30" to 72" x 192" . . . floor mounted or suspended . . . with one, two or three decks.

Proper sizing is no problem . . . when you put it up to Hewitt-Robins. Your cost per ton will be low. Your maintenance expense will be minor; many Hewitt-Robins Vibrating Screens are still going strong after more than 12 to 20 years of continuous service.

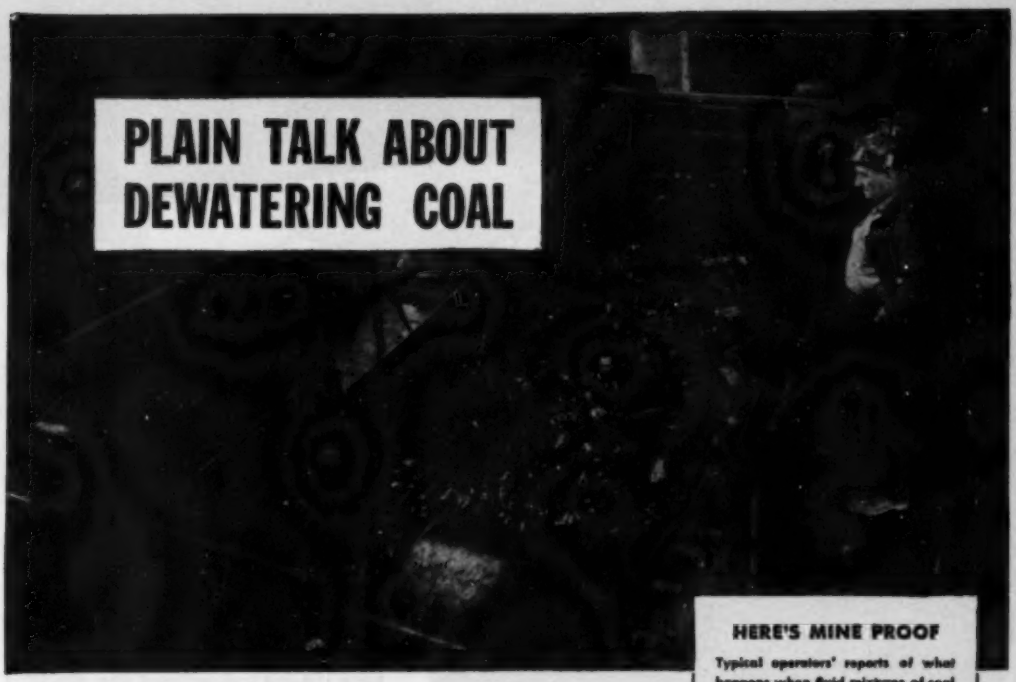
Screen your product accurately. Screen it economically . . . on Hewitt-Robins Vibrating Screens. Tell us your need. We'll give you the *one best* answer. Write to Robins Conveyors Division, Hewitt-Robins Inc., 270 Passaic Ave., Passaic, N. J.

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

**HEWITT-ROBINS**
**VIBRATING SCREENS**

**HEWITT-ROBINS** HR **INCORPORATED**

BELT CONVEYORS *(belting and machinery)* • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS • RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS • TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS



# PLAIN TALK ABOUT DEWATERING COAL

## *You have to do it, but it needn't cost a fortune!*

Let's face it. You have to wash your coal; good practice necessitates it. Before shipment, you have to dry that coal; customers and some state laws demand it.

So it boils down to this: how are you going to dry it . . . how much must you spend for equipment . . . how effective is that equipment?

Among available dewatering methods, one machine is far ahead of all others in the two factors most important to you: it costs as little as one-seventh of centrifugal-types; its demonstrated effectiveness is far greater than competing makes. This machine is the Hewitt-Robins Eliptex® Dewaterizer with patent-protected* deck.

The crucial test is in the smaller sizes. The Eliptex Dewaterizer discharges ⅛" x 0" bituminous with as little as 9% surface moisture; #4, #5 and even Ultra-Fine anthracite is reported "completely free of surface moisture" at the discharge end. Other typical verified field reports are shown in the box.

*The design, operation, decking and performance of the Hewitt-Robins Eliptex Dewaterizer cannot be secured in any other machine.*

Since business policy demands that you dry your coal, and economic conditions dictate every possible reduction in capital investment, it is just good common sense to investigate the Eliptex Dewaterizer and its field-proved effectiveness. Bulletin No. 129-A gives operating facts and performance figures. Your copy can be secured by writing Robins Conveyors Division, Passaic, New Jersey.

### HERE'S MINE PROOF

**Typical operators' reports of what happens when fluid mixtures of coal and water (often 2½ times water to coal, by weight) are fed to the Eliptex Dewaterizer:**

| SIZE | KIND | SURFACE MOISTURE LEFT |
|---|---|---|
| ⅛ mm | W. Va. Bit. | 10% |
| ¼" x 0" | Ky. Bit. | 9% |
| 7/16" x 0" | Ohio Bit. | 8% |
| ⅜" x ⅛" | W. Va. Bit. | 8½% |
| 1½" x ⅛" | W. Va. Bit. | 4½%-9% |
| ⅜" x 1/16" | Nova Scotia Bit. | 4½% |

**HEWITT-ROBINS**
**ELIPTEX**
**DEWATERIZER**

*U. S. Patents 2,310,724 and 2,437,018

**HEWITT-ROBINS** HR **INCORPORATED**

BELT CONVEYORS (*belting and machinery*) • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS • RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS • TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

# Spotlighting

*M.S.A. FaceDuster*—Fast, economical distribution of rock dust in all sections of mine. Ideal for the conveyor section.

*New M.S.A. Bantam High Pressure Rock Dust Distributor*—Rock dust right up to the working face. Readily transported in shuttle cars or on rubber tires.

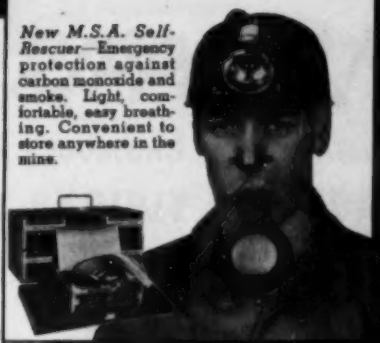
*R-4 Lamps*—Brilliant, unfailing, effective light that means added safety for the miner, added production for the mine.

*New M.S.A. Pneolator*—Safe, effective, automatic artificial respiration for all cases of arrested breathing.

You'll want to see and learn—first hand—the benefits this M.S.A. equipment can bring to your mining operations in helping your efforts to step up mine production and increase over-all mine safety. You are cordially invited to discuss your special problems in Booth 1009—Coal Show. We'll be looking for you.

*New M.S.A. All-Electric Steam Cleaner*—Quickly cleans grease and dirt from equipment. One man operation. Patented, and built under Homestead-Yeager design.

*New M.S.A. Self-Rescuer*—Emergency protection against carbon monoxide and smoke. Light, comfortable, easy breathing. Convenient to store anywhere in the mine.



# M·S·A Equipment

## OF IMPORTANCE TO YOUR MINE SAFETY AND PRODUCTION

## ...at Booth 1009-Coal Show

*New M.S.A. Bolt Hole Cleaner*—Self-contained unit removes dust when drilling for bolt roofing. Easy to operate.

*M.S.A. MinePhone Communication System*—Improves haulage efficiency with safety by permitting dispatcher to contact any or all motormen at any point in mine—motormen can reply or communicate with each other without stopping trip.

**MINE SAFETY APPLIANCES COMPANY**

BRADDOCK, THOMAS AND MEADE STREETS

At Your Service

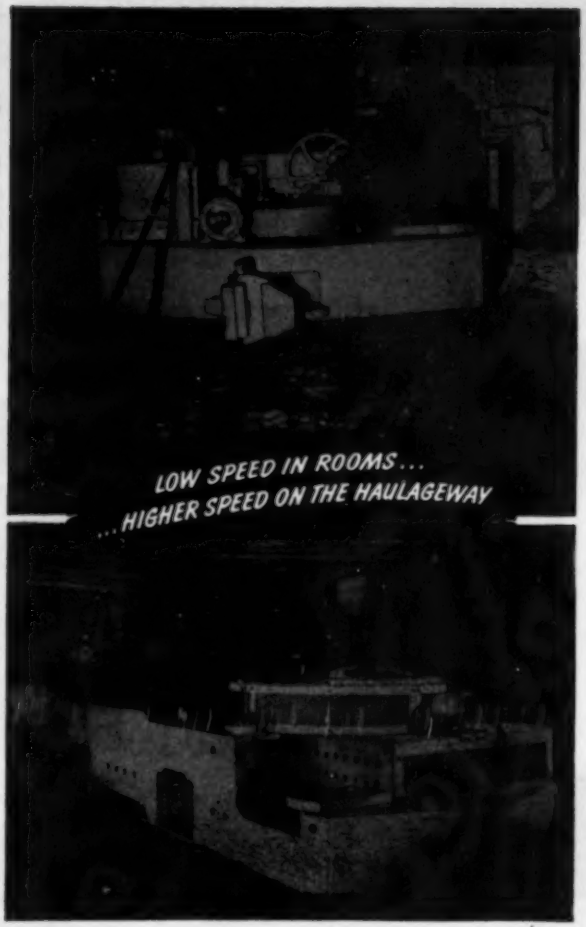
34 BRANCH OFFICES IN THE UNITED STATES AND CANADA

**When you have a safety problem M.S.A. is at your service. Our job is to help you.**

MSA

SAFETY EQUIPMENT HEADQUARTERS

# Cut haulage costs with Dual-Duty Locomotives




One locomotive for both gathering and secondary haulage . . . that's the Westinghouse Dual-Duty. Compact and well-balanced, it worms cars into remote rooms over rough uneven track and around sharp curves. A trailing cable, controlled by a gearless reel, supplies power for a rated speed of 5 to 5.5 mph at 5,000 pounds. But, once on the haulageway, speed is increased. A trolley supplies power for a rated speed of 8 to 9 mph at 5,000 pounds.

Since the same locomotive does both jobs, you realize immediate savings. For example, the Dual-Duty locomotive has a 50% advantage in speed, on the haulageway, over the usual gathering machine. On a typical 1,500-foot run each way, the saving could be 2 or 3 minutes—time to load one or more cars. Over a month, or even a week . . . these savings add up.

Over longer runs, the Dual-Duty locomotive speeds return of empties, does the work with fewer cars, and cuts loader waiting time.

Investigate Westinghouse Dual-Duty Locomotives. They can save you time and dollars. Get more information from your nearby Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna. J-15161

you can be SURE... if it's

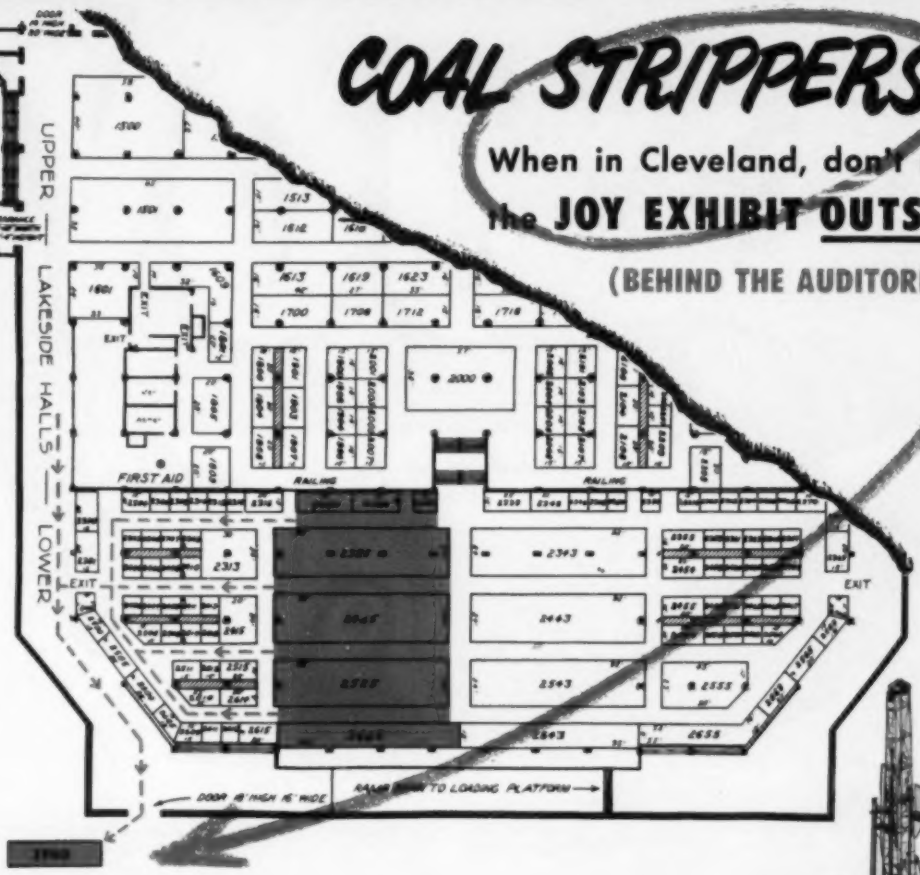
Westinghouse

MINE LOCOMOTIVES

# COAL STRIPPERS!

## When in Cleveland, don't miss the JOY EXHIBIT OUTSIDE

## (BEHIND THE AUDITORIUM)

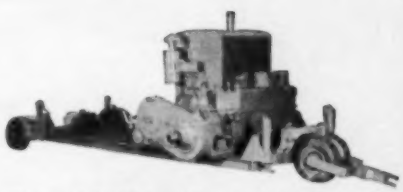



When you see the Joy exhibit on the main floor of lower Lakeside Hall (the solid orange space), you'll see the largest collection of mining equipment ever displayed by a single company. But don't overlook the additional Joy machines on display behind the Auditorium. The dotted orange lines on the map above show the way from the main Joy exhibit to the outside display.

See the revolutionary Champion Blast-Hole Drill *in action!* Actually drilling several times a day. Consult the clock in the main Joy exhibit for times of demonstration. Or just ask anyone in attendance at the Joy booth.

Also on operating display behind the Auditorium is the new Joy AD-3 Highwall Recovery Auger. You'll want to see this powerful drill in operation.

*The Joy Champion Blast-Hole Drill utilizes the new high-speed principle of rotary-airblast drilling, a Joy development.*



*The Joy AD-3 Highwall Recovery Auger. A powerful new unit for coal recovery from highwalls. Permits tremendous tons-per-man output.*

WSB CL-3181

**HIGHSPOTS of the COAL SHOW**

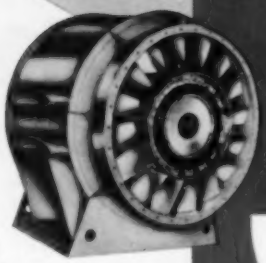
**THE JOY EXHIBITS... INSIDE and OUTSIDE**

# JOY

**AXIVANE* MINE FANS**

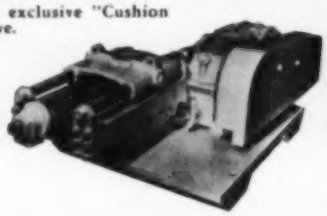
Vaneaxial-type fans for all main ventilation requirements—also Portable Blowers for auxiliary ventilation.

*Reg. U.S. Pat. Off.



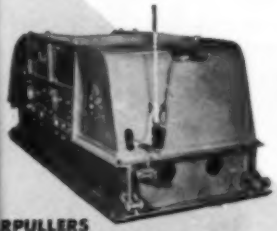
**SHAKER CONVEYORS**

Below, the exclusive "Cushion Stroke" drive.



**CONTINUOUS MINERS**

Models for high and low coal.



**MOBILE COAL CUTTERS**

Above, the 12-RB Cutter, designed for very low coal. Other trackless units include the 10-RU and 11-RU Universal Cutters.

**CARPULLERS**

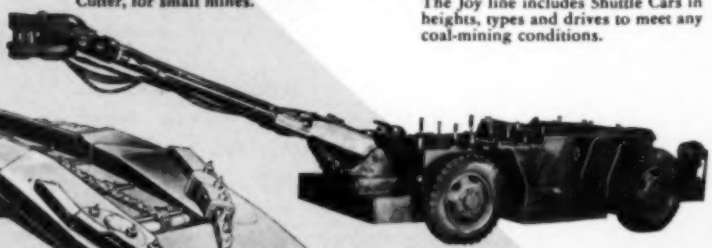
Other utility equipment includes a Cherpuller, Pulldozer, Timber Setter, Material Trucks, etc.

**SHORTWALL COAL CUTTERS**

Left, the 11-B Cutter, with Joy Bugduster for removal of cuttings from the kerf. Also the 7-B Heavy Duty, and 5-B1 Cutter, for small mines.

**LOW VEIN SHUTTLE CARS**

Above, the 8-SC Shuttle Car, only 26" high for use in very low coal. The Joy line includes Shuttle Cars in heights, types and drives to meet any coal-mining conditions.



**MECHANICAL LOADERS**

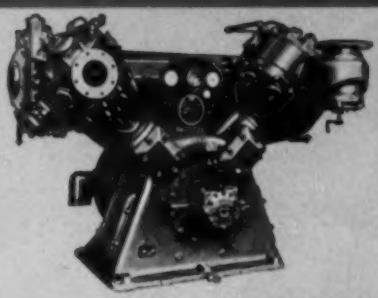
Above, the 20-BU, a high-capacity Loader only 24" in height for very low coal. Other Joy Loaders to meet any need.

**HYDRAULIC ROOF-BOLTING DRILL**

Above, the RBD-1, fastest drilling machine built for roof bolting. Joy also builds a complete line of hydraulic Coal Drills, single and twin boom.

# ...Your Complete Source of Mechanized Mining Equipment

## FIELD-PROVED to Give You Greatest Production Increases and Cost Reductions

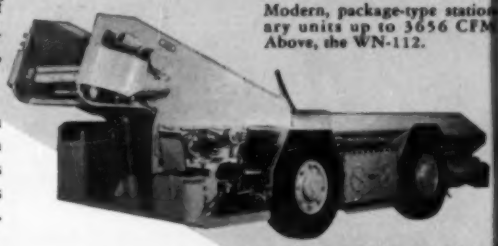


**AIR COMPRESSORS**

Modern, package-type stationary units up to 3656 CFM. Above, the WN-112.

JOY Mechanized Mining Equipment is the result of years of pioneering research, development and on-the-job engineering. It is the world's most complete line of modern mining machinery, built by the world's largest manufacturer in the field.

These facts have real importance for you because they give you positive assurance of equipment that can stand the gaff, stay on the job and operate with the sustained high efficiency that means greater tonnage and lower costs. Whatever your requirements or seam conditions may be, in soft coal or hard, there's a field-proved JOY unit to do the job *best.* ● Let us work with you.

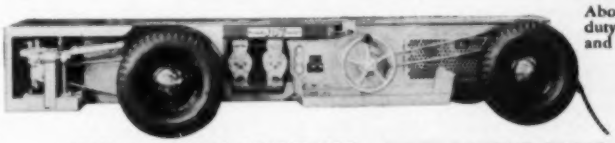


**HIGH-CAPACITY SHUTTLE CARS**

Above, the 10-SC—a rugged, heavy-duty Shuttle Car that can handle coal and rock in full seam mining.

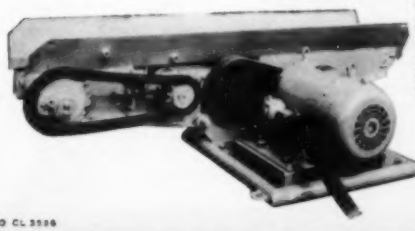
**PERMISSIBLE MINE-AIR COMPRESSORS**

B. of M. approved. Self-propelled (the WK-83, right) or draw-bar models, up to 240 CFM.



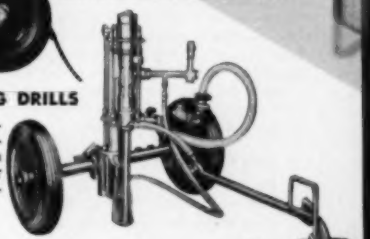
**BELT and CHAIN CONVEYORS**

Types and sizes to suit any conditions. Left, the new, light, simple and compact FA Chain Conveyor.



**ROOF-BOLTING DRILLS**

Right, the highly-mobile, fast-drilling SAW Wagon Stoper. Other drills for any roof-bolting need.



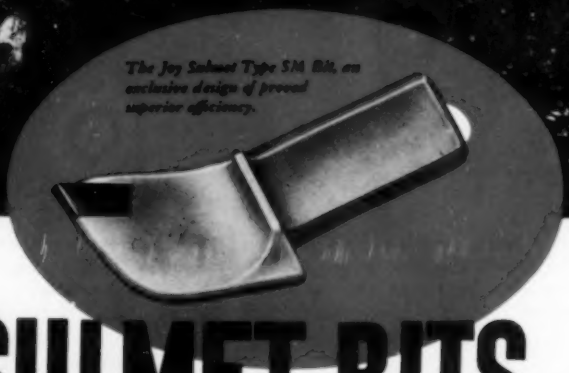
*Consult a Joy Engineer*

WBD CL 3506

# JOY MANUFACTURING COMPANY

**GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.**

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO




# JOY SULMET BITS

## PROVE AGAIN THEY'LL CUT YOUR COSTS

### CONDITIONS

Comparative performance of Joy Sulmet Type Sm Bits and two other makes of tungsten carbide bits on a Joy Continuous Miner. Seam about 96" thick—hard firm coal with a 1" or 2" rock parting, normally about 2 ft. from the top. Occasional sulfur intrusions in the coal; in general, fairly hard cutting.

### RESULTS

| | Joy SM Bits | Bits B | Bits C |
|---|---|---|---|
| Tons mined in test..... | 8113 | 7873 | 9145 |
| Comparative Bit Cost per ton, including grinding and setting..... | Low | 8.8% higher | 77.0% higher |

**The figures above demonstrate once more that Joy Sulmet Bits are best for the Continuous Miner, as well as for cutting machines of all types—a superiority well established in many different mining areas and under widely varying conditions. The exclusive Joy design, with a protective cap over the tungsten carbide insert, results in fewer broken bits and eliminates lost inserts.**

Write for Bulletin, or *Consult a Joy Engineer*

W&D CL 5818

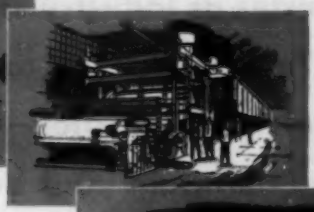
# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# *Now!* one-source help on every application of petroleum products:

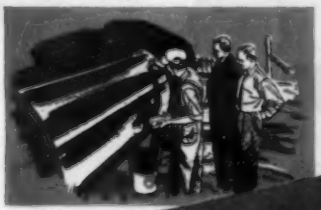
# GULF PERIODIC CONSULTATION SERVICE



Now you can get practical help on any problem that involves a petroleum product—any type of petroleum product—from this single source: GULF PERIODIC CONSULTATION SERVICE.

Through this advanced cooperative plan, Gulf makes available to you the regular counsel of one or more trained engineers, men who are skilled in every phase of petroleum science —men who have years of experience with practically every type of process and equipment employed by industry.

This knowledge and experience can be applied profitably to your operating and maintenance problems. Send the coupon below for your copy of the booklet "Gulf Periodic Consultation Service," which describes this cost-saving service. Or contact your nearest Gulf office.



GULF

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Name.....

Company.....

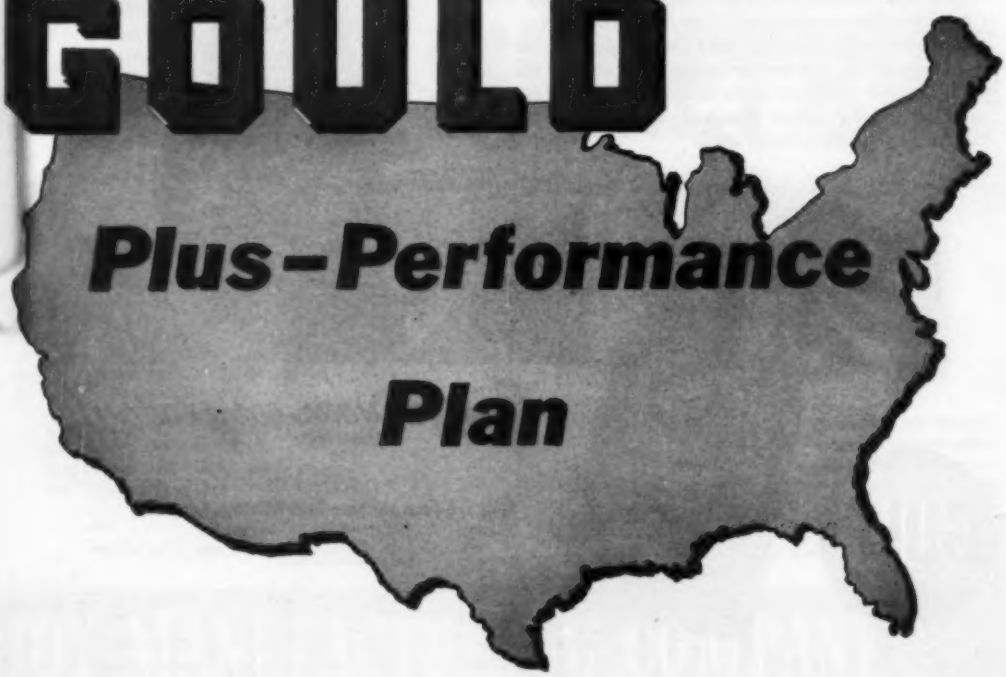
Title.....

Address.....

# Here's Help

**You demand more and more from your batteries as industry strains its facilities for defense. To help you get more out of these essential tools of production—to choose, use, handle and maintain your batteries without waste— Gould announces the**

# GOULD



# You Need NOW!

**Battery performance can be improved as much as 50%* if these eight points are put into practice:**

1. **Buy Your Batteries to Fit the Job.** Purchase of oversized or undersized batteries wastes money, materials and manpower.
2. **Install Your Batteries Correctly.** Connect them properly, ventilate adequately and handle according to printed instructions.
3. **Use Your Batteries Within Designed Capacities.** Overdischarge cuts down battery performance.
4. **Charge Your Batteries Properly.** Use recommended rates of initial, finish and float charges.
5. **Maintain Your Batteries Systematically.** Organize a preventive maintenance program.
6. **Inspect Batteries Periodically.** Tighten loose connections and replace worn cables.
7. **Test Your Batteries Regularly.** Keep a record of cell readings—know the condition of your batteries at all times.
8. **Replace When Necessary.** When you know the condition of your batteries, you can place your orders far enough ahead to insure continuous service.

**GOULD'S PLUS-PERFORMANCE PLAN is designed to help you conserve and extend your essential battery power. It is a complete, integrated system of manuals, articles, specifications, bulletins, record cards and charts which give you information on every one of these eight points—explaining and illustrating how to choose, use, install, charge, maintain, inspect and test.**

**From tests in the Gould Research Laboratory and performance tests in the field.*

## *LET THIS PLAN GO TO WORK FOR YOU...WRITE US TODAY!*

Any or all of the material available under the Gould PLUS-PERFORMANCE PLAN is FREE to battery users without obligation. A request on your letterhead stating the particular problem or problems in which you are interested, will bring the appropriate literature—and booklet explaining the complete plan—by return mail. Write us, attention Field Engineering Department.

**GOULD** **STORAGE BATTERIES**

**GOULD-NATIONAL BATTERIES, INC.,** TRENTON 7, NEW JERSEY

*Always Use Gould-National Automobile and Truck Batteries*

*Only Carlon...*

## THE FIRST REAL PIPE THAT IS PLASTIC!

ONLY CARLON can be installed rapidly where and when mine pipe is needed most. Whether used for emergency service or a permanent installation, CARLON plastic pipe solves costly, time-consuming installation, maintenance, and replacement problems in mines of all types.

CARLON is unaffected by sulphurous waters, alkalies, metallic salts and other corrosive wastes. It is light in weight and can be installed easily.

Guaranteed against rot, rust and electrolytic corrosion, CARLON has a service life many times that of metallic pipe. Its smooth internal surface will not accumulate scale and minimizes frictional loss.

CARLON is produced in flexible and rigid types in all standard pipe sizes. Flexible pipe is furnished in long lengths which require fewer fittings per installation and which conform to irregular surface contours as well as slope or entry direction. Rigid CARLON is shipped in threaded and coupled random 21-foot lengths which can be joined rapidly by threaded plastic fittings.

A complete line of molded plastic fittings incorporating standard I.P.T. is available for plastic-to-plastic or plastic-to-metal connections.

To solve your mine piping problems, specify ONLY CARLON.

*At present, raw material shortages are limiting the production of certain types of CARLON pipe. Every effort is being made to overcome this problem and to meet the demand and need for CARLON... the first real pipe that is plastic.*

107-CP

**CARLON PRODUCTS CORPORATION**

IN CANADA: MICRO PLASTICS, LTD., ACTON, ONTARIO

10225 MEECH AVENUE • CLEVELAND 5, OHIO

# NEW Easy to Clean Protected From Dirt

THIS NEW *Safety Circle* totally-enclosed, fan-cooled motor cannot clog with dirt. The ribbed cooling surfaces are outside the motor. There are no pockets or crevices where dirt can collect. Cooling air is not enclosed at any point except the fan cover.

Cleaning is the simplest of maintenance operations done in a few seconds with an air hose. The fan cover also can be removed very quickly for a thorough cleaning.

**Factory Lubricated Bearings**

Bearings are lubricated at the factory and operate without attention or cost for years. The frame of this *Safety Circle* TEFC motor is cast iron, inherently corrosion resistant, strong and rigid. The extra rigidity of the cast iron frame holds the bearings in true alignment under severe operating conditions. This gives long bearing life and low operating costs.

**Get All The Facts**

The new *Safety Circle* totally-enclosed fan-cooled motor is built in all NEMA standard frame sizes from 224 to 505. Your Allis-Chalmers Authorized Dealer or Sales Office has complete information. Call today or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B6144. A-3235

**Sold . . .**
**Applied . . .**
**Serviced . . .**

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

**CONTROL** — Manual, magnetic and combination starters; push button stations and components for complete control systems

***TEXROPE*** — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

**PUMPS** — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

*Safety Circle, Texrope* and *Vari-Pitch* are Allis-Chalmers trademarks.

**ALLIS-CHALMERS**

# Is your competitor

**TO COMBAT SEVERE ABRASION** American Tiger Brand 6x30 Type G, Excelloy Flattened Strand Lang Lay. This rope has a larger metallic area than round strand ropes, greater strength, greater resistance to abrasion and high resistance to crushing. Without doubt, you will get longer service and lower wire rope costs if you use it.

**TO COMBAT FATIGUE** Tiger Brand 6x37—Type S Excelloy Preformed. This rope is listed as "Special Flexible Hoisting Rope" and is also known as "Crane Rope." It is the most flexible of standard constructions which permits its use with small sheaves and drums. Its reserve strength is highest of the standard constructions.

**FOR RESISTING CRUSHING** Tiger Brand 6x19 Seale Patent Excelloy Monitor Preformed IWRC. Here's a rope that is widely used where resistance to crushing is necessary. It stands up under heavy abrasion, yet has sufficient flexibility for winding on medium sized drums.

**THE "OLD WORKHORSE"** Tiger Brand 6x19 Type N Excelloy Preformed Standard Hoisting Rope is more widely used in a greater variety of applications than any other type. It has a superior combination of qualities —good resistance to abrasion and fatigue, high strength and long life. With wire core it has 7½% greater strength than with fiber core.

# SMARTER than you?

## You may be paying double his wire rope costs unless you follow a few simple rules

The wrong wire rope on a job where abrasion or fatigue is severe has been known to cut service life in half . . . and careless handling or just plain abuse will result in similar short service. To get the best wire rope for your job, you should consider these four major requirements carefully—

1. **Is it strong enough to take care of any load that may be applied, with a proper factor of safety?**
2. **Does it have the ability to withstand repeated bending without failure of the wires from fatigue?**
3. **Will it withstand abrasive wear?**
4. **Can it take crushing?**

A proper choice is made by correctly estimating the relative importance of each quality and selecting a rope that has the best combination of properties for your application.

### HOW THE TIGER BRAND SPECIALIST CAN HELP YOU

It is obvious that one or even a few types of wire rope can't meet all conditions. What's more, the average user can't be an authority on wire rope. That's why it's so important to use the engineering knowledge of a man who has made wire rope application his life work. The Tiger Brand Wire Rope Specialist can analyze your problems and recommend the best rope to fit your needs.

American Steel & Wire Company
Rockefeller Building, Dept. J-5
Cleveland 13, Ohio

Please send me your 128-page handbook, "American Tiger Brand Wire Rope."

Name.....

Company.....

Address.....

City.....Zone...State.....

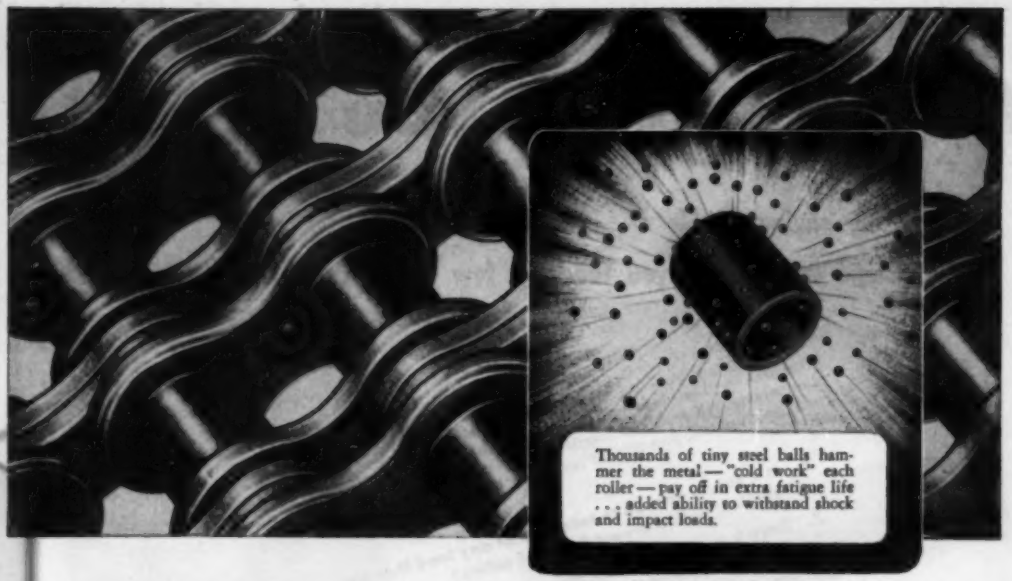
AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO · COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

**AMERICAN TIGER BRAND WIRE ROPE**

*Excellay Preformed*

UNITED STATES STEEL



Thousands of tiny steel balls hammer the metal — "cold work" each roller — pay off in extra fatigue life . . . added ability to withstand shock and impact loads.

**Why you should be sure the roller chain you buy has**

# SHOT-PEENED ROLLERS

**. . . one of the extra-strength features you get with every LINK-BELT Roller Chain**

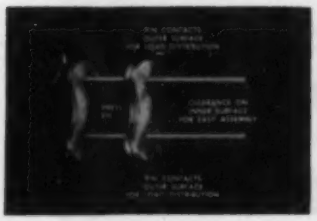
LOOK for the distinguishing darkened rollers on every roller chain you buy! They're your guarantee of extra fatigue life.

Shot-peening is just one of the added manufacturing refinements that make Link-Belt Precision Steel Roller Chain a longer-life chain. Controlled material selection and heat treating assure absolute uniformity . . . no weak members.

Link-Belt Roller Chain is available in single or multiple widths, in ⅜ to 3 in. single and double pitch. For the best in roller chain, get in touch with your nearest Link-Belt office.

---

**Easier coupling and uncoupling without sacrificing load distribution**



Patented E-Z Assembly feature of Link-Belt Precision Steel Roller Chain has won world-wide approval. Coupling and uncoupling of multiple width chains—right on the job—is far easier. There's absolutely no sacrifice of load distribution . . . no loss of the chain's remarkable performance. Press-fits between chain pins and middle bars have been modified. But full load-carrying capacity across the entire width of the chain has been maintained.

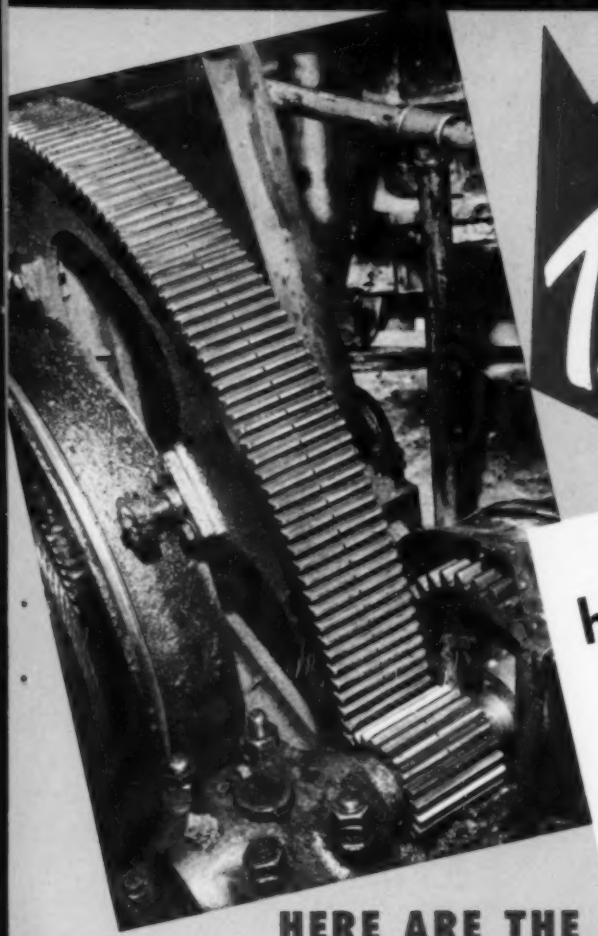
**LINK-BELT**

**PRECISION STEEL ROLLER CHAIN**

LINK-BELT COMPANY: Indianapolis 6, Chicago 9, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in principal cities. 13.888

at the CARBON FUEL COMPANY

CARBON, WEST VIRGINIA



Protective cover removed to show "Tool Steel" Drum Gear and Pinion.

THIS TOOL STEEL PROCESS DRUM GEAR and PINION

has given 11 years of trouble-free service and is still less than 50% worn!

## HERE ARE THE FACTS!

TYPE OF MACHINE: 40 H.P. Man and Supply Hoist.

OPERATION: Hoisting men and supplies. 8 hours per day, 5 days per week.

**Service Life:**

"TOOL STEEL" Installed July, 1939 and still in service. "Tool Steel's" indicated service life should be at least 22 times that of untreated gears!

COMPETITIVE MATERIAL Cut steel — untreated. 2 gears and 2 pinions completely worn in 2 years. Average life only 1 year per set.

TOOL STEEL'S EXCLUSIVE GUARANTEE

All "Tool Steel" Parts Carry a Written Guarantee to Outlast Any Other Products Used in the Same Service!

"Tool Steel's" service life can be equalled by no other products!

"TOOL STEEL" PROCESS

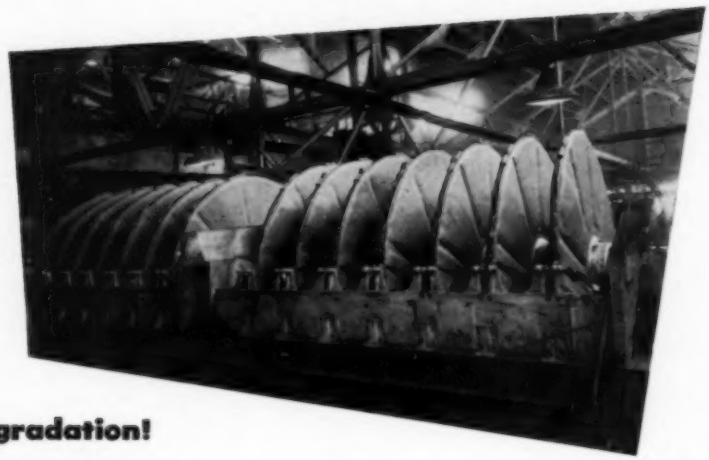
*The Standard of Quality*

*for* GEARS • PINIONS • SPROCKETS • WHEELS *and other* HARDENED PRODUCTS

# THE TOOL STEEL GEAR & PINION CO.

CINCINNATI 16, OHIO, U. S. A.

# DEWATERING FINE COAL



**. . . without Degradation!**

**. . . with Clean Filtrate!**

DO IT the American way. A play on words? Yes, but nowhere can you find a more effective, higher capacity unit for dewatering fine coal than the American Continuous Filter.

Better yet, nowhere can you find a unit which, considering the stream pollution problem confronting coal companies, will do what a real dewaterer is supposed to do: separate solids from liquids without letting the solids through in damaging percentages. Filtrate from the American Filter handling fine coal (⅛" and under) carries on the average less than 1% solids.

And best of all — you will find that all this effective dewatering takes place *without any degradation of product.* The coal is handled gently.

Bring your fines dewatering problem to Oliver United. We have laboratory facilities and field test units for determining the best filter station. And we have several types of dewaterers to complement the American where sizes are such as to call for a different filter.

New York 18 — 33 W. 42nd St. Chicago 1 — 221 N. LaSalle St.
Oakland 1 — 2900 Glascock St. San Francisco 11 — 260 Calif. St.
Export Sales Office — New York • Cable — OLIUNIFILT

FACTORIES:
Hazleton, Pa.
Oakland, Calif.

**OLIVER UNITED FILTERS INC.**

**WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES**

CANADA
E. Long, Ltd.
Orillia, Ontario

MEXICO & CENT. AMERICA
Oliver United Filters Inc.
Oakland, Calif.

EUROPE & NORTH AFRICA
Dorr-Oliver S. A. Brussels
Dorr-Oliver S.N.a.R.L. Paris
Dorr g.m.b.h. Wiesbaden (16)
Dorr-Oliver Co., Ltd., London, S.W. 1
Dorr-Oliver S.a.R.L. Milano
Dorr-Oliver, N.V. Amsterdam-C

PHILIPPINE ISLANDS
E. J. Nell Co.
Manila

HAWAIIAN ISLANDS
Honolulu
A. R. Duvall

WEST INDIES
Wm. A. Powe — Havana

SOUTH AMERICA & ASIA
The Dorr Co., New York

AUSTRALIA
Hobart Duff Pty., Ltd.
Melbourne

SOUTH AFRICA
E. L. Bateman
Johannesburg, Transvaal

# Your hauling costs can be cut!

## *Here are 8 big reasons why TIMKEN® bearings cut your costs of hauling coal and ore*

1. **GREATER RESISTANCE TO SHOCK LOADS.** Timken tapered roller bearings are made of Timken® fine alloy steel and case-hardened to provide a hard, wear-resistant surface and a tough, shock-resistant core. On over 500,000 mine cars Timken bearings have proved they can take the shock loads in their stride and insure trouble-free mine car performance.

2. **GREATER CAPACITY.** Loads are carried on a *line* of contact between rollers and races.

3. **EASY STARTING, LONGER TRAIN LENGTHS.** True rolling motion of Timken bearings reduces friction, permits easy starting and more cars per train.

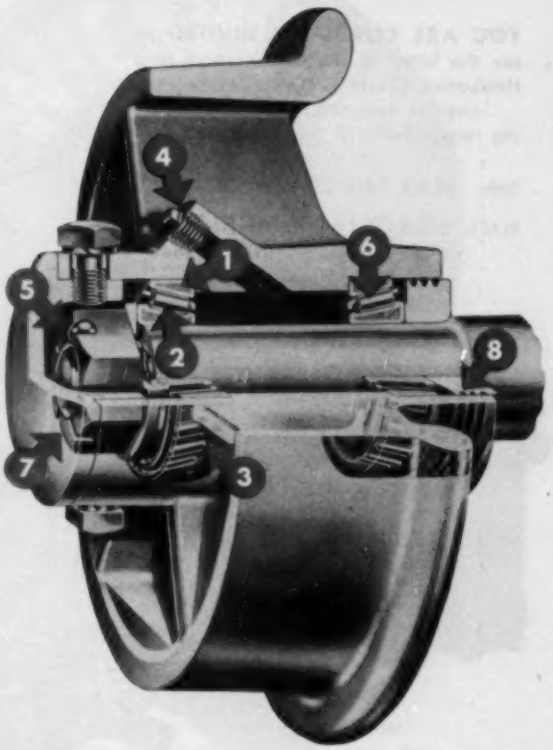
4. **PERIODIC LUBRICATION.** No matter what kind of bearings you use, periodic lubrication will lengthen their life, reduce your costs. Replacing old, dirty, moisture-laden grease with fresh, live, protective grease is cheap insurance for trouble-free car operation.

5. **INSPECTION SIMPLIFIED.** Wheels can be easily removed for bearing inspection by simply pulling the cap, cotter pin and nut.

6. **CARS TAKE CURVES EASIER** because Timken tapered roller bearings take both radial and thrust loads in any combination. No special thrust plates or bearings needed.

7. **ADJUSTABLE FEATURE INCREASES BEARING LIFE.** Timken bearings in well-maintained cars show practically no wear. However, if some wear should occur after long years of service, the resulting bearing looseness can be removed simply by tightening the nut.

8. **DUST COLLAR PROTECTS LUBRICANT.** And it increases the effectiveness of periodic lubrication by permitting old grease to be flushed from the bearings when new lubricant is added.




Specify Timken roller bearings for *your* mine cars and assure yourself of all these cost-saving advantages. Call in our mine car bearing experts today and let them show you how your hauling costs *can* be cut! The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

*Cut your hauling costs by specifying* **TIMKEN** TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬮ AND THRUST →⬮← LOADS OR ANY COMBINATION →✳←

# Important

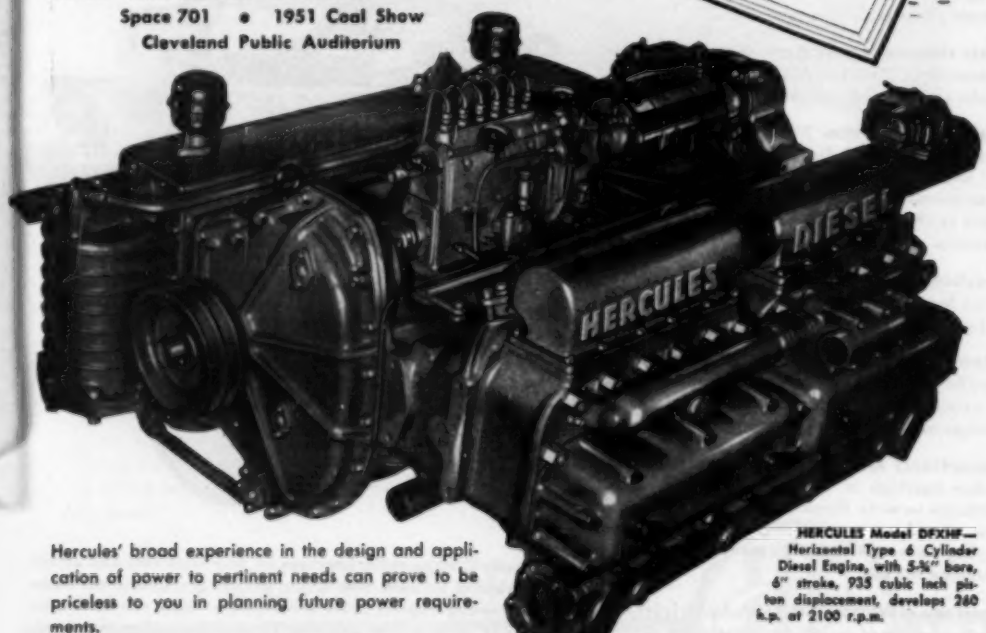
**MARK THIS DATE**

**ON YOUR CALENDAR NOW!**

**YOU ARE CORDIALLY INVITED** to see the latest in Hercules Vertical and Horizontal Diesel & Gasoline Engines . . . engines designed to meet the exacting requirements of the mining industry.

TIME: ***MAY 14th-17th, 1951***

PLACE: **HERCULES EXHIBIT**
**Space 701 • 1951 Coal Show**
**Cleveland Public Auditorium**




**HERCULES Model DFXHF—** Horizontal Type 6 Cylinder Diesel Engine, with 5-½" bore, 6" stroke, 935 cubic inch piston displacement, develops 260 h.p. at 2100 r.p.m.

Hercules' broad experience in the design and application of power to pertinent needs can prove to be priceless to you in planning future power requirements.

See the famous HERCULES Line of vertical and horizontal engines . . . diesel and gasoline power . . . at the Coal Show. Men of the Hercules Motors Corporation will be on hand to discuss your power problems with you. Pay us a visit, won't you?

## HERCULES MOTORS CORPORATION

**CANTON, OHIO, U.S.A.**

# FROM INGOT TO FINISHED ROPE:

## there are no gaps in our

# Quality Control

**At the American Mining Congress be sure to drop in and see us at booths #628 and #630. A warm welcome awaits you.**

Quality control of Wickwire Rope is *complete and uninterrupted* from the actual smelting of our own iron and steel to the final making of the finished rope.

Only a company like C. F. & I. with its constant checking, testing and inspection through every step of manufacture can give you the big advantages that are derived from a constant and uniform size of steel grain in each grade of finished rope wire. When you specify Wickwire Rope you're sure of wire rope that's unequalled for safe and unfailing performance . . . longer, more economical and uniform service on the job.

*LOOK FOR THE YELLOW TRIANGLE ON THE REEL*

**WICKWIRE ROPE** CFI

**A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION**

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass. EXECUTIVE OFFICE—500 Fifth Avenue, New York 18, N. Y.

SALES OFFICES—Abilene (Tex.) • Boston • Buffalo • Casper • Chattanooga • Chicago • Denver • Detroit • Emlenton (Pa.) • Houston • New York Odessa (Tex.) • Philadelphia • Phoenix • Salt Lake City • Tulsa

PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

# *There's only one*
# TAPER-LOCK

**Precision-Grooved**

**True Running**

**Easy on—Easy off**

TAPER-LOCK bushing grips the shaft for the full length of the bushing — holds sheave with firmness of a shrunk-on fit. No wobble. Taper-Lock runs true!

No flange—no collar—no protruding parts. Flush machine-tool appearance.

Finest grade of close-grained semi-steel, cast in the Dodge foundry.

The grooves, machined on precision equipment, have identical pitch diameters. This insures equal belt tension. Every belt pulls its share of the load!

TAPER-LOCK sheaves are available from distributors' stocks in complete range of sizes in A, B, C and D grooves.

**DODGE SEALED-LIFE BELTS** have special protection for tension members, insuring longer belt life. Perfectly matched to TAPER-LOCK sheaves.

**DODGE MANUFACTURING CORPORATION, 3000 Union Street, Mishawaka, Ind.**

**DODGE**
*of Mishawaka, Ind.*

**CALL THE TRANSMISSIONEER,** your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified phone book.

**FIRST** IN POWER TRANSMISSION MACHINERY!

V-BELTS AND TAPER-LOCK SHEAVES

DODGE-TIMKEN PILLOW BLOCKS

DELLING GRIP AND DIAMOND D CLUTCHES

SOLID STEEL CONVEYOR PULLEYS

**GOING TO THE COAL SHOW? SEE DODGE PRODUCTS IN BOOTHS 632-634 IN THE MAIN EXHIBITION HALL**

# YOU S-T-R-E-T-C-H

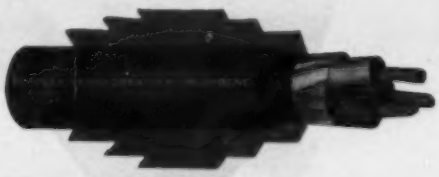
# THIS WAY...

Unlike the housewife who uses bread crumbs and other materials to "stretch" the available supply of hamburger, Simplex is not able to add materials to copper to make it go further. We do achieve the same result, but by an entirely different means. Our way is to insulate the copper with Simplex-Anhydrex XX high voltage insulation. It is the very best "copper extender" that we know.

Simplex-Anhydrex XX is a product of Simplex research and development. It is an insulation that is absolutely "tops" in the high voltage field. It is designed to operate at a maximum of 167° to 176°F. (75° to 80°C.) copper temperature, depending on operating conditions. It has all the properties you want in such a high voltage rubber insulation. It will withstand heat. It also withstands ozone and aging, and it is guaranteed not to absorb more than 15 milligrams of water per square inch of exposed surface when tested in accordance with U. S. Coast Guard standards.

So far as we know it is the only insulation of its kind. Use it wherever you have a high voltage problem, whether the cables are to be installed directly in the earth, underground in ducts, under water, or overhead supported from messenger wire.

You can help to "s-t-r-e-t-c-h" the small available supply of copper by insisting that your high voltage cables be insulated with Simplex-Anhydrex XX insulation. Do you want to know more about this unique insulation? Then fill in the coupon below.



**SIMPLEX-ANHYDREX XX**

SIMPLEX WIRE & CABLE CO.
79 Sidney St., Cambridge 39, Mass.

SIMPLEX WIRE & CABLE CO.
79 SIDNEY ST., CAMBRIDGE 39, MASS.
GENTLEMEN: PLEASE SEND A COPY OF BOOKLET 1609A TO:

NAME_____ TITLE_____
COMPANY_____
STREET_____
CITY_____ STATE_____

# ANOTHER OPERATOR "Automatics". . . .

When two different operators in different sections of the country each install 16 new S-D 1-2-3 "Automatics" and one operator saves $24,000 and the other $20,000 annually, it is no coincidence! You couldn't expect the mining conditions to be the same, but all mines profit with S-D "Automatic" bottom dumping cars. If 16 S-D "Automatics" save one operator $20,000.00, then 16 S-D "Automatics" can be expected to save another operator just about as much, if not more, as these two cases prove.

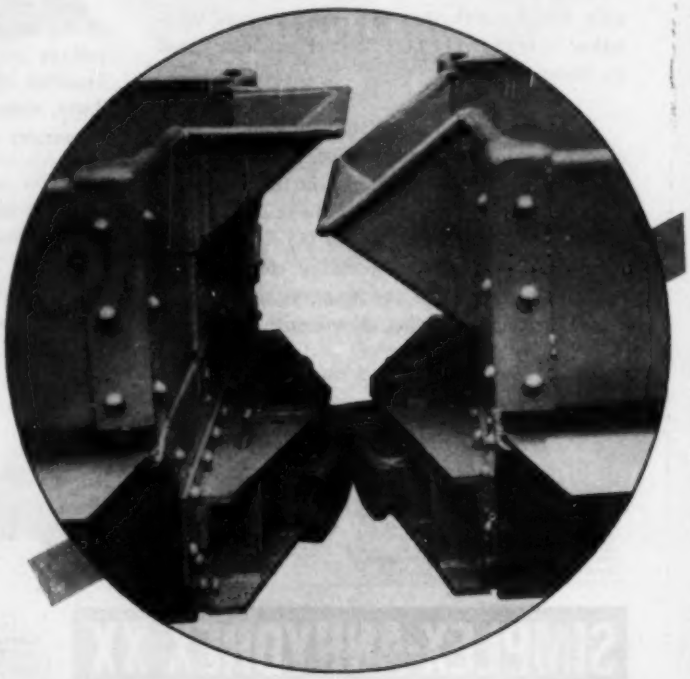
You have already read the story about the operator who saved $24,000.00. The operator who saved $20,000.00 did it by saving five man shifts

## Coal Show Marks SANFORD-DAY'S 50th Anniversary

The 1951 Coal Show will mark the half century point for Sanford-Day in serving the mining industry . . . 50 years of devoting its entire capacity to engineering and producing better mine cars to meet every requirement of coal mining.

Our display at the show will be of unusual interest to every coal mining man . . . a display you should not miss!

We cordially invite all members of the coal mining industry to visit us at Booth 1805, see our display, and join us in our 50th Anniversary Celebration!



**SANFORD-DAY**
**KNOXVILLE**

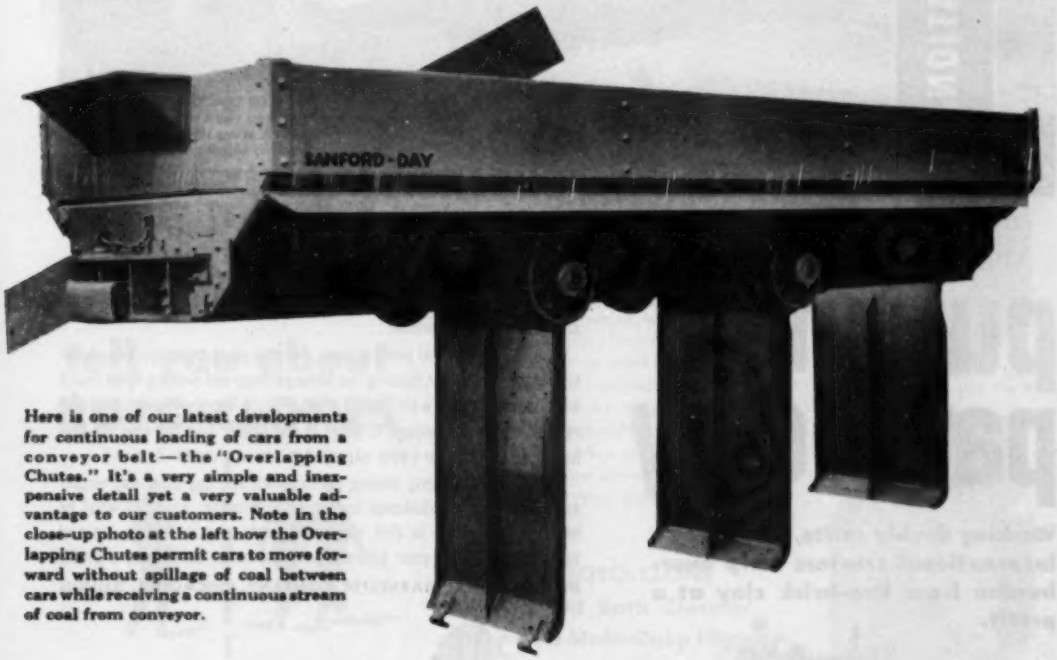
# INSTALLS 16 S-D 1-2-3 Saves $20,000.00 Annually!

a day after installing the S-D "Automatic" System of coal haulage.

The S-D "Automatic" System comprises any number of required cars (usually one-third to one-half the number of old cars) plus an adequate surge bin. On this particular change-over, it required only 16 S-D 1-2-3 "Automatics" to replace 100 old cars. This company also installed mechanical loading to cut costs to the very minimum all the way down the line and take full advantage of the non-stop, dumping-on-the-move cycle of S-D "Automatics." Think of it! Sixteen S-D "Automatics" and a surge bin replaced 100 end dump cars!

A surge bin of sufficient capacity is essential to continuous, flexible coal production and low cost operation because (1) it permits full time mine operation with only part time operation of screening plant, and (2) it guarantees independent non-stop operation of either screening plant or mine in case of temporary shut-down of one or the other.

If you are using obsolete, worn out cars in your mines, and are without a surge bin, let one of our engineers discuss improvements that will make coal mining more profitable. Drop us a line today!




Here is one of our latest developments for continuous loading of cars from a conveyor belt—the "Overlapping Chutes." It's a very simple and inexpensive detail yet a very valuable advantage to our customers. Note in the close-up photo at the left how the Overlapping Chutes permit cars to move forward without spillage of coal between cars while receiving a continuous stream of coal from conveyor.

**IRON WORKS**
**TENNESSEE**

**TRACTOR TRACK MEET.** Busy Internationals match work strides with full loads as they shuttle up ramp between clay pit and spoil pile.

INTERNATIONAL

POWER THAT PAYS

# puttin' the pay in clay

**Working double shifts, Gus Riney's International tractors strip overburden from fire-brick clay at a profit.**

Two International crawlers, pulling scrapers and working ten hours a day, are making clay pay for Gus Riney of Mexico, Missouri. He talks straight from the shoulder:

"Our TD-14 is a real profit maker. For two years it has worked alongside bigger machines, hauling the same yardage and making three round trips where others were making two. It's a money maker, and the repairs are hardly enough to enter in the books. And the new TD-18A has more power than I ever expected to see in a tractor its size."

For proof of top strip mining performance and day-after-day endurance, see your International Industrial Distributor. Find out what he offers in service—in full stocks of parts and in factory-trained mechanics to keep your International power on the job at a profit.

**INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS**

**SPOIL PILE EXPRESS.** TD-14 with maneuverable, fast-operating hydraulic two-wheel scraper completes 200-foot haul to spoil pile.

# Get the facts in Cleveland

You are cordially invited to visit Booths Nos. 232-236 at the Coal Show to inspect the latest developments in Roto-Clone Dust Control Equipment and Cycoil Air Cleaners.

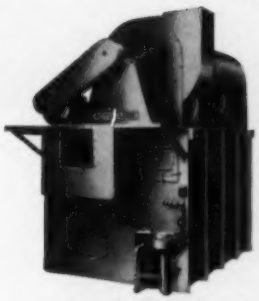
**American Air Filter**
COMPANY, INC.
267 Central Avenue, Louisville 8, Kentucky

## Let us tell you about ROTO-CLONES

for
**dust free tipples . . .**
**clean air for dryers . . .**
**fines collection from air tables**

### TYPE N ROTO-CLONE

A full scale operating model will be available for your inspection. It will be a No. 8 unit of 8000 CFM capacity showing in complete detail the principle of hydro-static precipitation. See for yourself how the Type N which recycles its own water, cleans dust-laden air without the aid of a single moving part.



Type N Roto-Clone—Unit No. 8

***also see:***

**TYPE W ROTO-CLONE**
**CYCOIL Oil Bath Cleaner**
**Type CMS Multi-Duty Filter**

American Air Filter makes the only complete line of dust control and air filtering equipment.

Cutaway of Type N with double impellers

AAF **American Air Filter**
COMPANY INC.,

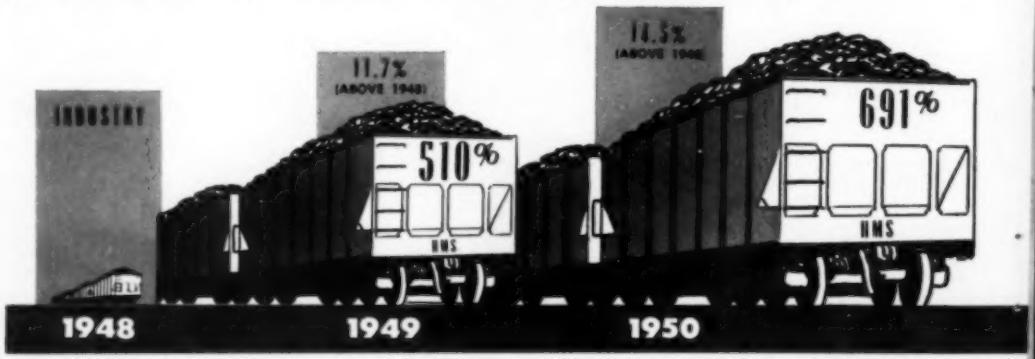
267 Central Ave., Louisville 8, Kentucky • In Canada: Darling Bros., Ltd., Montreal, P. Q.

# *Again in 1950-51*

## THE TREND IS TO HEAVY-MEDIA SEPARATION

FOR HIGHER RECOVERY OF CLEANER COAL

3-YEAR GROWTH • HMS CAPACITY vs. TOTAL U. S. BITUMINOUS CLEANED*




BITUMINOUS TONNAGE CLEANED • HMS vs. ALL OTHER METHODS COMBINED

*Pictorial Statistics based on tabulations of U. S. Bureau of Mines and principal coal publications.

**No other cleaning process ever gained such rapid acceptance by so many leading companies on so much tonnage from so many seams under such diverse operating conditions.**

Why has the use of Heavy-Media Separation grown so fast?

**BECAUSE** – it makes an extremely accurate separation of "pre-determined specification" coal from near-gravity refuse by reason of the exceedingly small differences in their specific gravities. This is extremely important to "total seam" mechanized mines.

**BECAUSE** – it is the only coal cleaning process that provides automatic, continuous and complete removal of large and variable amounts of refuse without volumetric limitation.

**BECAUSE** – it is the only coal cleaning process that provides unique applications of magnetomotive force to provide constant control, conditioning and recovery of the medium.

**BECAUSE** – it maintains the desired separating gravity within ± 0.01 at any gravity from 1.25 to 2.50 . . . never loses efficiency due to intermittent feed or sudden increase in the refuse content of the raw coal.

**BECAUSE** – it recovers more near-gravity coal than any other method, as demonstrated by the profitable installation of Heavy-Media Separation units to recover saleable coal from the refuse and middlings of older cleaning plants.

Before you decide on any separation method for a new cleaning plant or to supplement your present facilities, it will pay you to inspect an operating Heavy-Media Separation Plant . . . to make a comparative study of its better over-all grade and recovery.

As Technical and Sales Representative for Heavy-Media Separation Processes, we will be pleased to assist in arranging your visits to plants near you. We can also run carload tests on your coal in the Heavy-Media Semi-Commercial Plant of the Cyanamid Mineral Dressing Laboratory at Stamford, Conn. Although we do not design or build plants, we can put you in touch with experienced engineering-construction firms who do, including builders of pre-fabricated plants with capacities up to 400 tons per hour. We will work closely with your staff or engineers of your choice in the design and initial operation of your Heavy-Media Separation Unit.

## MINERAL DRESSING NOTES No. 18 "COAL PREPARATION"

This 36-page book, recently issued, clearly and concisely explains the fundamental principles of the Heavy-Media Separation method. With photomicrographs of medium samples from an operating plant, it shows how Heavy-Media Separation employs unique and exclusive applications of magnetomotive force to provide constant control, conditioning and recovery of the medium. It describes typical operating plants, contains test results, flow schemes and other new useful data.

AMERICAN Cyanamid COMPANY

MINERAL DRESSING DIVISION

30 ROCKEFELLER PLAZA NEW YORK 20, NEW YORK

*HEADQUARTERS FOR A COMPLETE WORLD-WIDE SERVICE IN EVERYTHING RELATING TO*

# DIAMOND CORE DRILLING

Sixty years of successful experience, backed by ample plant facilities and financial resources, enables us to manufacture Drilling Machines that can be relied upon for long periods of continuous high-speed operation with the greatest possible percentage of good core recovery.

## DRILLING MACHINES

and Complete Accessory Equipment for Core Drilling and Dry Sampling

Model 48-C Core Drilling Machine with Gasoline Engine Power Unit and oil-operated Hydraulic Swivel-head. Other Models are shown in our bulletins and in our "Mining Catalog" insert.

## "TRUCAST" BORTZ DIAMOND BITS

have proved their superiority for years in all types of rock formation. Set with any desired grade of bortz diamonds in a matrix of either copper or nickel alloy and available in a wide variety of standard and special types and sizes, ranging from 1-1/2" to 7-3/4" in diameter. Write for Bulletin No. 44-A.

MODERN design, rugged construction, liberal use of alloy-steel parts and anti-friction bearings throughout minimize time losses and operating expense. Swivel-head can be either "Screwfeed" or "Hydraulic". Power Unit can be either a gasoline or a Diesel engine, an air engine or an electric motor — each driving the Swivel-head and Hoisting Drum through a built-in four-speed sliding-gear transmission. A complete line of improved accessory equipment provides for every drilling and sampling requirement. Write for Bulletin No. 185.

## CONTRACT DRILLING *anywhere in the world*

Besides being manufacturers we are one of the largest contractors for any type of Diamond Core Drilling. This includes exploratory drilling for coal and ore, foundation-test drilling for bridges, dams and other heavy structures, grout holes and pressure grouting. Experienced crews and supervisors are available at all times — for service anywhere in the world. Estimates, and constructive suggestions whenever possible, submitted promptly on request.

## SPRAGUE & HENWOOD, Inc., Scranton 2, Pa.

Branch Offices: NEW YORK · PHILADELPHIA · PITTSBURGH

Sgt. Robert Chrisman levels a field at the eastern end of the Davison airstrip, Ft. Belvoir, Va., with a "Cat" D7 Tractor. In the background are four "Cat" No. 12 Motor Graders completing runway.

# THE MILITARY GETS FIRST CALL

THESE "Caterpillar" earthmoving machines, working on the runway of the Davison airstrip at Ft. Belvoir, Va., show at a glance where a lot of "Cat" equipment is going these days. And that's how it's got to be.

Defense Rated Orders get first call as America's military establishment prepares for what may come. The urgent build-up of our power has meant drafting machines as well as men. An ever-increasing flow of "Caterpillar" equipment and parts is going to the support of America's fighting men and to defense projects.

This means that there already exists a scarcity of "Cat" equipment and engines for civilian use. So it is to *your* advantage to make the machines you now have *last*. You can keep them on the job longer by doing these things:

**1** Follow sound and recommended operation and maintenance procedures to the letter. Read and reread your Operator's Instruction Book.

**2** Make full use of your "Caterpillar" dealer's facilities for servicing and rebuilding machine parts.

**3** Anticipate future parts needs, then contact your dealer and let him help. But *don't* buy or order parts you don't actually need.

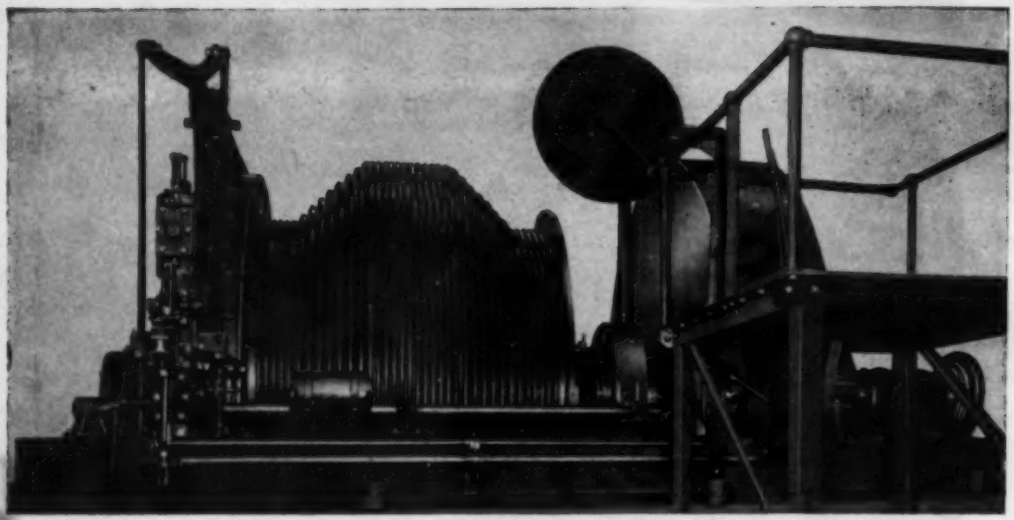
Caterpillar Tractor Co. will do everything possible to maintain every "Caterpillar" machine in the field, to provide new machines as fast as possible, and to allocate them as fairly as possible.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

**CATERPILLAR**

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

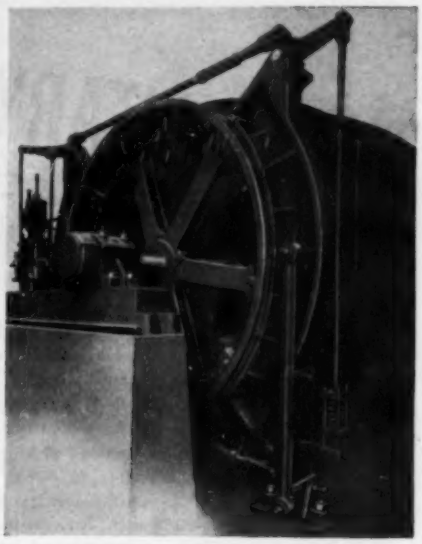


900 hp. Electric Hoist for balanced hoisting. Cast steel bi-cylindro-conical drum, built in four sections, is 9 to 12 ft. in diameter with machined grooves for 1⅛" rope. Dependable safety devices stop the hoist quickly but smoothly in event of power failure, and prevent overwinding, over-speeding, or starting in wrong direction. Post brakes on drum and auxiliary brake on pinion shaft operated by gravity-actuated air-brake engine. Single-reduction herringbone gears are completely enclosed in oil-tight welded-steel guard. Illustration shows shop assembly without motor or electrical control equipment.

# For LOW-COST Hoisting in a West Virginia Coal Mine

In balanced hoisting at a well-known West Virginia coal mine the modern Vulcan Electric Hoist here illustrated and described combines high capacity with minimum power consumption. Its outstanding feature is the bi-cylindro-conical drum, cast in our own open-hearth steel foundry, which permits rapid acceleration without excessive peak load on the motor and assures minimum inertia of rotating parts during deceleration. Other features that make for fast, safe, hoisting at lowest ultimate expense are shown in the accompanying illustrations.

Your hoisting conditions may be entirely different but whatever they are Vulcan engineers can meet them with the right design—backed by experience acquired during a hundred years of continuous service to the mining industry. Correspondence regarding any present or prospective hoisting requirement is cordially invited. Illustrated bulletins on request.



Rear view showing air-operated parallel-motion post-type brake with pressure-graduating rig. The latter is an exclusive Vulcan feature which assures smoother, more uniform, graduated braking pressure than would otherwise be possible.

1849 VULCAN CENTENNIAL 1949

# Vulcan Iron Works

## WILKES-BARRE, PA., U.S.A.

Other Vulcan products include Allcasteel Sheaves, Cages and Skips, Shaking-Chute and Chain Conveyors and all types of Locomotives for underground and surface haulage. Write for illustrated bulletins.

A Practical Application of Gates SPECIALIZED Research

# A High-Speed Traveling Track Used to Test Aircraft Landing Gear...

**V-Belt Drive Designed by Gates Engineers**

- ✓ *Track Traveling Speed of 120 to 180 miles per hour—*
- ✓ *Massive Weight to be Accelerated Quickly*
- ✓ *Terrific Torque upon Deceleration*

A large Aircraft Manufacturer planned to test aircraft landing gear by dropping the gear onto a track that would travel at airplane landing speeds of 120 to 180 miles per hour. The landing gear would be loaded with weight to equal that of fully loaded aircraft.

Clearly, the shock impact of the loaded gear, its huge wheels motionless, dropping onto the rapidly moving track, would be very great. As the landing gear hits the track, power to the motor is disconnected, permitting the track to travel on its own momentum. To accelerate the huge wheels and slow down the track requires fully 7600 pound feet of torque. Then the drive must bring the massive track mechanism back up to speed in a minimum of time to be ready for the next test.

It was not by accident that Gates Engineers had complete data—*all worked out in advance*—covering the specifications of a V-Belt Drive that has very competently handled this most exacting assignment.

This *pre-solution* of Drive design is possible only because Gates operates the largest V-Belt testing Laboratories in the world. Here, Gates runs an *average* of 32,000 hours of testing *every week* on V-Belts alone! (32,000 hours is equivalent to five years of life for one belt.)

And the real value to *you* of such exhaustive testing is this:—all *results* of these tests are immediately reduced by Gates Application Engineers to *usable data* for the design of V-Belt drives from which *any task whatever* may be required.

Such intensively *SPECIALIZED* Research has naturally given Gates Engineers a most advanced knowledge of V-Belts and V-Belt Drive Design—and the benefit of this advanced knowledge and experience is available to *you, right in your own plant, any time you want it!*

Whether you have a difficult drive to design—whether some V-Belt drive in your plant is giving trouble—or whether you merely want to know what size and construction of V-Belts will give the most efficient and the lowest cost service on a particular drive—you have only to phone a Gates Engineer near you in all industrial centers.

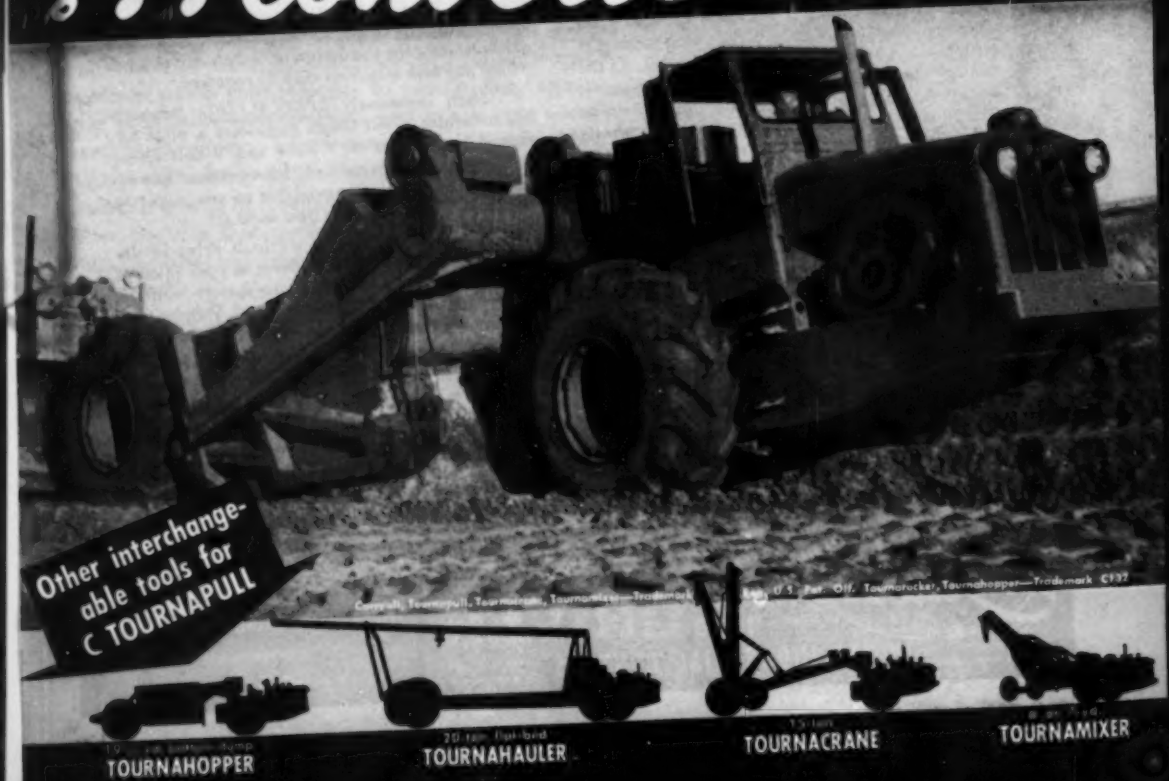
Just look in your phone book under "Gates Rubber." A Gates Engineer will come to you promptly—and he will put at your service the full benefits of Gates unrivaled V-Belt knowledge and experience *without the slightest obligation!*

ENG-511

Gates VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries
THE GATES RUBBER COMPANY
DENVER, U. S. A.
The World's Largest Makers of V-Belts

# 35 m.p.h. "C" HAULS

# . . . converts to STRIP



# SHOVEL ROCK

## with 18-ton rear-dump TOURNAROCKER

- 17 heaped yard capacity
- 9½′ x 12½′ bowl for big target
- 13′ 9″ turning radius with 15′ 10″ Wheelbase
- 4-wheel air brakes with 3836 sq. in. brake surface
- Big 21.00 x 25 low-pressure tires
- Simple electric body hoist
- Weighs approx. 38,650 lbs. complete

Here's just *one* profitable use for versatile, 35 m.p.h. C Tournapull prime mover in mines and quarries. Coupled to 18-ton, rear-dump Tournarocker, it's a big-production hauler. Operator takes it through its cycle at top speed, with complete safety, because Tournarocker has 3,836 sq. in. of braking surface — *more on one wheel than most haulers have on all four.* Holding action of powerful 4-wheel, disc-type air brakes, plus *front-wheel drive,* let Tournarocker back up to edge of bank, dump load clear. Eliminates rehandling, saves dozer clean-up. Simple electric hoist (no troublesome hydraulics) tips body to vertical position. Smooth, clean, streamlined bowl clears loads instantly. In addition to big-payload, and fast-cycle hauling with Tournarocker . . . money-saving interchangeability with Carryall *doubles* Tournapull's earning capacity for mine and quarry owners. For example . . .

# SCRAPER DIRT

## with 15 cu. yd. CARRYALL SCRAPER

- 18-ton load capacity
- Finger-tip electric control on apron, bowl, load-ejector tailgate
- Open-top bowl for shovel loading
- 4-wheel disc-type air brakes
- 21.00 x 25 tires interchangeable with prime mover or Tournarocker
- Total weight approx. 34,500 lbs.

For less than 25% of the cost of the original unit, the Tournarocker interchanges with a scraper . . . is ready to strip overburden, move spoil banks, build and surface haul roads. All you need is Carryall body — same Tournarocker wheels and tires can be switched to Scraper, substantially reducing cost of unit interchangeability. The giant 21.00 x 25 tires assure ample flotation in mud. Constant-pull, power-proportioning differential also reduces weather delays . . . gives positive traction on soft banks and slick pit grades.

Thus, Carryall and Tournarocker keep your "C" prime mover working and earning all year 'round. Other auxiliary hauled units, shown below, further save time and reduce equipment investment per job. Two diesel engines, 165 and 186 h.p., are now available in the "C" prime mover to best fit your requirements. Your LeTourneau Distributor can also show you this money-saving Tournapull package in both *larger* and *smaller* sizes. Call him TODAY!

**LETOURNEAU** PEORIA, ILLINOIS — JOB-PROVED Over 7000 Built and Shipped — **TOURNAPULLS**

MORE YARDS PER HOUR WITH RUBBER-TIRED POWER

## When Choosing V-Belts Remember These Two Words ...They Mean Exactly What They Say!

**"DEPENDABLE RUGGEDNESS"** didn't get into the BWH trade mark by accident. It means *precisely* what it says . . . Bull Dog V-Belts assure steady, smooth, low cost power transmission — *uninterrupted by premature belt failure.* You save on maintenance costs, keep the wheels of power moving!

**TOUGH PROBLEMS INVITED** — Ask us or your nearest BWH distributor about your power transmission belting, conveyor belting and hose problems. We're specialists in making mechanical rubber products work *better, longer.*

- **SPECIALLY ENGINEERED BWH CORD SECTION**
  Noted for high tensile strength. *Benefit:* superior load carrying capacity, ability to absorb shock loads, uniform matching when used in sets.
- **MINIMUM STRETCH**
  Results from a new, exclusive technique in processing Bull Dog Cords. *Benefit:* reduced slippage, a minimum of adjustments, longer belt life.
- **DURABLE COVERS**
  The secret's in the closeness of weave of the heavy, bias cut fabric. *Benefit:* it can take the severe wearing action of the sheave while sealing the belt against moisture, dirt and grease.
- **WITHSTANDS SEVEREST FLEXING**
  The "reason why" here is due to constant research in the development of quality - controlled compounds by BWH. *Benefit:* these compounds run cooler and do not crack or deteriorate under severe flexing.

For these reasons make your next V-Belt purchase order read "Bull Dogs" — and buy them by the set!

*Another Quality Product of*

**BOSTON WOVEN HOSE & RUBBER COMPANY**

**Distributors in all Principal Cities**

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

# EYE OPENERS

## to be shown by DOOLEY BROS. at the Coal Show

Here are the facts about the new hydraulic. It's packed with power from one end to the other — driven by a 25 H.P. 250 Volt motor. Two wheels with individual drive — hydraulic tramming and two mounted drills operate at variable speed and feed. The tires are rugged 7.50x16 8 ply. This new unit is 22'6" long, 6'2" wide, 3' high and has a wheel base of 6'. This unit is highly maneuverable and has braking power to make it stay put. The NEW Superior hydraulic is the answer to all of your drilling needs.

Contactor assembly

Cut off switch

Cut-off and reset

We take pride in introducing this smooth operating safety switch to industry. So efficient in its operation that the slightest touch of a hand or elbow will instantly cut off the power on the entire machine. Originally built for DOOLEY BROS. drill arms and drills this contactor is applicable to any type of machine using electric power.

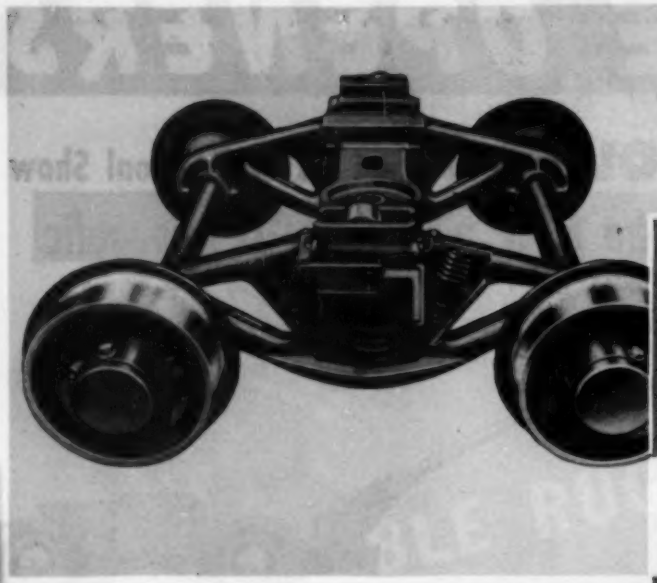
Current is turned on at the rear of the truck by a small, well protected button. After the machine becomes live all current can be shut off instantly by either drill operator or from the rear of the machine simply by touching any one of the three mushroom type cut-off buttons. In order to make the machine operational again it is necessary to push the button at the rear of the truck.

VISIT OUR BOOTH No. 1902-4-6

As applied to other types of equipment additional cut-off switches may be added as necessary so that the current may be broken from any number of points on the machine.

# DOOLEY BROS.

1201 S. WASHINGTON ST. PEORIA, ILLINOIS

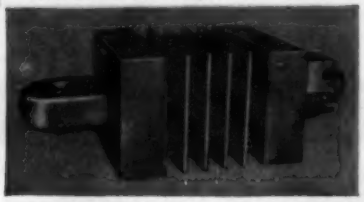


The NC-1 Truck climaxes 20 years of intensive research, providing (through the friction control mechanism shown in cutaway) protection to equipment, roadbed and lading with maximum wear life.

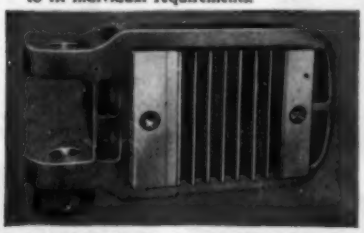
Willison Automatic Couplers save time with maximum safety . . . can be coupled at either end of car or locomotive . . . require no manual assistance. Close coupling eliminates damaging slack, permits high speeds with maximum stability.

# NATIONAL *products cut per ton costs!*

Latest example of National's pioneering in better equipment is the NC-1 Truck. Its sweeping advancements over conventional trucks include long soft springs, a friction mechanism—controlling vertical and transverse oscillations, a cast one-piece bolster with large lubricated center connection, and automatic frame alignment. The NC-1 has been designed with the same factor of safety that is required by the Association of American Railroads for full size railroad trucks, and embodies the same features which A.A.R. tests have shown to be essential to produce good riding qualities. For the best in profitable equipment, *always specify National products.*



National M-230 Rubber-Cushioned Draft Gear for cars operating through rotary dump. Soft initial-action, high-capacity rubber pads provide maximum impact protection, lengthen equipment life. Available in a range of capacities and design variations to fit individual requirements.



M-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Maximum protection in minimum space.

A-3862

**Be sure to visit Booth 1618 at the American Mining Congress 1951 Coal Convention and Exposition • May 14-17 • Cleveland, Ohio**

**NATIONAL MALLEABLE and STEEL CASTINGS COMPANY**

WILLISON AUTOMATIC COUPLERS • NC-1 TRUCKS • DRAFT GEARS • NACO STEEL WHEELS

NATIONAL Products FOR TRANSPORTATION AND INDUSTRY

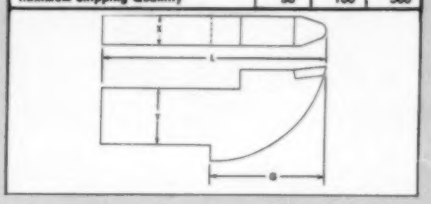
# KENNAMETAL

**Mining Division • Kennametal Inc., Latrobe, Pa.**

MACHINE BITS • DRILL BITS • ROCK BITS • STRIP BITS

## Machine Bit Specifications and Prices

| CAT. No. | Dimensions | | | | Price each in lots of | | |
|---|---|---|---|---|---|---|---|
| | O | X | Y | L | 50-99 | 100-499 | 500-1999 |
| U-1 | 1 13/16" | 1/2" | 1" | 3 5/8" | $1.46 | $1.33 | $1.21 |
| U-1-H | | | | | 1.58 | 1.46 | 1.33 |
| U-4 | 1 13/16" | 1/2" | 1" | 4" | 1.46 | 1.33 | 1.21 |
| U-4-H | | | | | 1.58 | 1.46 | 1.33 |
| U-3-H | 1 1/2" | 3/8" | 1 3/16" | 3 1/4" | 1.78 | 1.65 | 1.53 |
| U-6 | 2 1/2" | 3/4" | 1 3/16" | 3 5/8" | 1.65 | 1.53 | 1.40 |
| U-6-H | | | | | 1.78 | 1.65 | 1.53 |
| U-7 | 1 13/16" | 1/2" | 1" | 4" | | | |
| U-8 | 1 1/2" | 1/2" | 1" | 3 5/8" | 1.72 | 1.58 | 1.46 |
| U-9-H | 1 3/4" | 3/8" | 1 3/16" | 3 5/8" | | | |
| U-1-R | 1 1/2" | 1/2" | 1" | 3 5/8" | | | |
| U-4-R | 1 3/4" | 1/2" | 1" | 4" | | | |
| U-5-R | 1 1/2" | 3/8" | 1 3/16" | 3 1/4" | | | |
| U-6-R | 2 1/2" | 3/4" | 1 3/16" | 3 5/8" | 1.90 | 1.78 | 1.65 |
| U-7-R | 1 3/4" | 1/2" | 1" | 4" | | | |
| U-8-R | 1 1/2" | 1/2" | 1" | 3 5/8" | | | |
| U-9-R | 1 3/4" | 3/8" | 1 3/16" | 3 5/8" | | | |
| Minimum Shipping Quantity | | | | | 50 | 100 | 500 |



Regular Duty

Medium Duty

Heavy Duty

Special Duty

Special Heavy Duty

## Mining Machine Bits

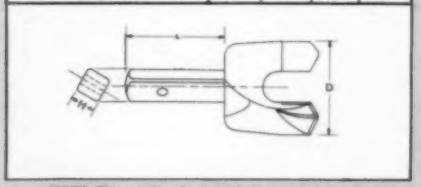
Kennametal Mining Machine Bits are designed and constructed to give maximum coal cutting efficiency. Their hard Kennametal cemented carbide cutting edge greatly prolongs service life and the bit body, of highest quality steel, is heat-treated and shaped to give the best possible tip support. Shoulder construction gives added support to the tip, provides self-gaging, and prevents the bit from being driven down into the machine bit block.

Records show that the amount saved by Kennametal Machine Bits, divided up among lower sharpening cost, less bit changing, lower power consumption, less machine maintenance, and less cutting time, can amount to saving in production cost of 4 cents to 6 cents per ton.

Kennametal Machine Bits are furnished for regular duty cutting, in seams comparatively free from hard impurities; for medium duty cutting, in more difficult cutting conditions; for heavy duty cutting, where conditions are extremely severe.

## Drill Bit Specifications and Prices

| CAT. No. | Dimensions | | | Prices each in lots of | | | |
|---|---|---|---|---|---|---|---|
| | D | H | L | 1-9 | 10-24 | 25-49 | 50-199 |
| RD-1 1/8 | 1 1/8" | 1/2" | 2" | $6.05 | $5.90 | $4.95 | $4.65 |
| RD-1 3/8 | 1 3/8" | | | 6.15 | 5.60 | 5.05 | 4.75 |
| RD-1 1/2 | 1 1/2" | | | 6.25 | 5.70 | 5.15 | 4.85 |
| RD-1 5/8 | 1 5/8" | | | 6.60 | 6.05 | 5.50 | 5.20 |
| RDC-1 5/8 | | | | 7.70 | 7.15 | 6.60 | 6.30 |
| D-1 5/8 | 1 5/8" | | | 6.75 | 6.20 | 5.65 | 5.35 |
| DC-1 5/8 | | | | 7.85 | 7.30 | 6.75 | 6.45 |
| D-1 7/8 | 1 7/8" | | | 6.85 | 6.30 | 5.75 | 5.50 |
| DC-1 7/8 | | | | 7.95 | 7.40 | 6.85 | 6.60 |
| DD-1 7/8 | 1 7/8" | 5/8" | | 6.85 | 6.30 | 5.75 | 5.50 |
| DDC-1 7/8 | | | | 7.95 | 7.40 | 6.85 | 6.60 |
| DD-2 | 2" | | 2 1/2" | 6.95 | 6.40 | 5.85 | 5.60 |
| DDC-2 | | | | 8.35 | 7.80 | 7.25 | 6.95 |
| D-2 1/8 | 2 1/8" | 3/4" | | 8.15 | 7.60 | 7.05 | 6.80 |
| DC-2 1/8 | | | | 9.55 | 9.00 | 8.45 | 8.15 |
| D-2 1/8 | 2 1/8" | | | 8.60 | 8.05 | 7.50 | 7.25 |
| DC-2 1/8 | | | | 10.10 | 9.55 | 9.00 | 8.70 |
| DD-2 1/8 | 2 1/8" | Hex. 1 1/16" | | 8.60 | 8.05 | 7.50 | 7.25 |
| DDC-2 1/8 | | | | 10.10 | 9.55 | 9.00 | 8.70 |
| D-2 3/8 | 2 3/8" | 3/4" | | 9.65 | 9.10 | 8.55 | 8.30 |
| DC-2 3/8 | | | | 11.15 | 10.60 | 10.05 | 9.75 |
| D-3 | 3" | | | 10.75 | 10.20 | 9.75 | 9.45 |
| DC-3 | | | | 12.60 | 12.00 | 11.45 | 11.10 |
| Minimum Shipping Quantity | | | | 1 | 10 | 25 | 50 |




*NOTE: This catalog sheet can be torn out along perforation at left, if you want to keep it in your file.*

Style D

Style DC

Style RD

## Kennametal Drill Bits

Kennametal Drill Bits are constructed to provide maximum drilling efficiency in coal and rock. Their hard Kennametal cutting edges are properly designed to give the most ideal balance possible for drilling speed and bit life. The cutting edge is angled to give the greatest chipping action and the most rapid penetration possible. The bit forging is soundly engineered to produce smooth conveying action and to withstand punishing service in rock. Footage ranges between 3,000 and 7,000 feet under normal use and drilling speed can be increased 20% to 50% when high speed drills are used. Bit changing is reduced to a minimum. The bit assures true, straight holes and makes loading and tamping easier.

The regular D and DD styles drill coal, slate, shale, clay, etc. The DC style is for drilling rock and material that normally cores.

**Supplement S70-3** 1-25-51

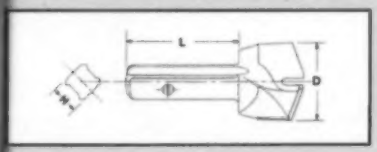
*Prices are F.O.B. Latrobe, Pa., and are subject to change without notice.*

# Kennametal Inc.
LATROBE, PA.

## Roof Bit Specifications and Prices

| CAT. No. | Dimensions D | H | L | Prices each in lots of 1-9 | 10-24 | 25-49 | 50-199 |
|---|---|---|---|---|---|---|---|
| FD-1 | 1" | | | $6.10 | $5.55 | $5.00 | $4.70 |
| FD-1 1/16 | 1 1/16" | | | 6.15 | 5.60 | 5.05 | 4.75 |
| FD-1 1/8 | 1 1/8" | | | 6.20 | 5.65 | 5.10 | 4.80 |
| FD-1 3/16 | 1 3/16" | | | 6.25 | 5.70 | 5.15 | 4.85 |
| FD-1 1/4 | 1 1/4" | | | 6.25 | 5.70 | 5.15 | 4.85 |
| FD-1 5/16 | 1 5/16" | | | 6.30 | 5.75 | 5.20 | 4.95 |
| FD-1 1/2 | 1 1/2" | 1/2" | 2" | 6.70 | 6.15 | 5.60 | 5.30 |
| HFD-1 1/2 | 1 1/2" | | | 6.80 | 6.30 | 5.75 | 5.45 |
| HFD-1 5/8 | 1 5/8" | | | 6.95 | 6.40 | 5.85 | 5.55 |
| HFD-1 3/4 | 1 3/4" | | | 7.05 | 6.50 | 5.95 | 5.65 |
| HFD-1 7/8 | 1 7/8" | | | 7.15 | 6.60 | 6.05 | 5.75 |
| HFD-1 1/2 | 1 1/2" | | | 7.25 | 6.70 | 6.15 | 5.85 |
| HFD-1 1/2 | 1 1/2" | | | 7.85 | 7.30 | 6.75 | 6.45 |
| HFD-1 1/4 | 1 1/4" | | | 10.60 | 10.05 | 9.50 | 9.20 |
| HFD-1 7/8 | 1 7/8" | | | 11.10 | 10.55 | 10.00 | 9.70 |
| HFDD-1 7/8 | 1 7/8" | 5/8" | | | | | |
| HFD-2 | 2" | | 2 1/4" | 11.50 | 10.95 | 10.40 | 10.10 |
| HFD-2 1/2 | 2 1/2" | | | 14.80 | 14.20 | 13.65 | 13.30 |
| Minimum Shipping Quantity | | | | 1 | 10 | 25 | 50 |

See preceding page for prices and specifications on RD Bits.



Style HFD

Style RD

## Roof Bit Drilling Series

Kennametal Roof Bits give fast drilling and low bit cost in any roof. One of the three Kennametal bit styles can give you the fastest hole drilling possible, at the very minimum bit cost. These various styles are especially designed to produce more efficient, lower cost drilling for roof bolting. Each style is an original development by Kennametal, featuring the hard Kennametal cemented carbide cutting edge.

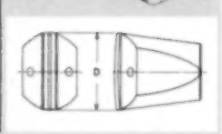
The RD Style drills rapidly and lasts long in boney, shale, and slate. The FD Series has the ability to drill the hardest material that can be rotary drilled with a cemented carbide blade. Both the RD Series and the FD Series can be used in regular coal drills. Special roof-type, scroll-less augers, called pinning rods, are used.

The PA Series and PT Series Kennametal Rock Bits (below) are fast, efficient drill bits for drilling massive sandstone and limestone formations that are too difficult to be drilled by rotary drills.

## Rock Bit Specifications and Prices (Chisel Type Bit)

| CAT. No. | D | Price each in quantities of 1-24 | 25-99 | 100-499 | 500 or more |
|---|---|---|---|---|---|
| PAA-1 1/4 | 1 1/4" | $12.75 | $11.95 | $11.65 | $11.20 |
| PAF-1 5/8 | 1 5/8" | 13.30 | 12.50 | 12.10 | 11.65 |
| PAF-1 1/2 | 1 1/2" | 12.85 | 12.95 | 12.65 | 12.20 |
| PAH-1 5/8 | 1 5/8" | 14.95 | 14.05 | 13.60 | 13.20 |
| PAH-1 3/4 | 1 3/4" | 15.95 | 14.95 | 14.50 | 14.05 |
| PAH-2 | 2" | 17.60 | 16.50 | 16.05 | 15.50 |
| PAD-2 | 2" | | | | |
| PAD-2 1/4 | 2 1/4" | 22.65 | 21.30 | 20.55 | 19.90 |
| PAD-2 1/2 | 2 1/2" | 27.50 | 25.85 | 25.05 | 24.30 |
| PAD-3 | 3" | 32.55 | 30.55 | 29.55 | 28.60 |
| PAY-3 | 3" | | | | |

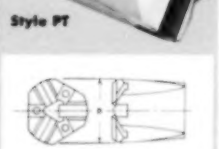
Style PA




## Rock Bit Specifications and Prices (3-Point Style Bit)

| CAT. No. | D | Price each in quantities of 1-24 | 25-99 | 100-499 | 500 or more |
|---|---|---|---|---|---|
| PTA-1 1/4 | 1 1/4" | $12.75 | $11.95 | $11.65 | $11.20 |
| PTF-1 5/8 | 1 5/8" | 13.30 | 12.50 | 12.10 | 11.65 |
| PTF-1 1/2 | 1 1/2" | 13.85 | 12.95 | 12.65 | 12.20 |
| PTH-1 5/8 | 1 5/8" | 14.95 | 14.05 | 13.60 | 13.20 |
| PTH-1 3/4 | 1 3/4" | 15.95 | 14.95 | 14.50 | 14.05 |
| PTH-2 | 2" | 17.60 | 16.50 | 16.05 | 15.50 |
| PTD-2 | 2" | | | | |
| PTD-2 1/4 | 2 1/4" | 22.65 | 21.30 | 20.55 | 19.90 |
| PTD-2 1/2 | 2 1/2" | 27.50 | 25.85 | 25.05 | 24.30 |
| PTD-3 | 3" | 32.55 | 30.55 | 29.55 | 28.60 |
| PTY-3 | 3" | | | | |

Style PT

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## Kennametal Rock Bits

Kennametal Rock Bits have strong wear-resistant inserts of Kennametal cemented carbide that stay sharp more than 100 times as long as steel. The super-tough steel body is heat-treated to assure the longest possible bit life.

Kennametal Rock Bits give long service life without serious gage loss, offer faster drilling speeds, lower bit cost, and require less bit changing and less bit reconditioning. They can be used in stopers, sinkers, wagon drills, and drifters.

The chisel, or PA Style offers the faster drilling speed for hard rock. The three-blade, or PT Style offers rapid drilling in both hard and medium rock, and ravelly ground.

### Bits are Threaded to Fit Standard Shoulder-Type Drill Rods

The PAA 1¼ and PTA 1¼ bits have ⅞ inch diameter threads and fit on A-threaded drill rods. The PAF and PTF bits have ⅞ inch diameter threads and fit the F-threaded drill rods. The PAH and PTH bits have 1 inch diameter threads and fit the H-threaded drill rods. The PAD and PTD bits have 1⅜ inch diameter threads and fit the D-threaded drill rods. The PAY, PTY, and PXY bits have 1½ inch diameter threads and fit the Y-threaded drill rods. Specifications for the Y threads will be supplied on request.

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LATROBE, PA.

## Kennametal Open-Pit Bits

**THE KENNAMETAL SD STYLE OPEN-PIT BIT** assures many hundreds of feet of drilling in slate, shale, and other similar materials, or in high wall that is not uniform in structure and which contains rock nodules. Prongs of the bit have Kennametal cemented carbide tips that enable it to drill many holes before reconditioning. Diameters range from 4" to 9", prices from $40.70 to $148.50 depending on bit size and quantity. Available with square, hex. or splined shank.

**KENNAMETAL UD BITS** are the most powerful of Kennametal Bits for service in solid or fragmented rock. Cutters are regular Kennametal Mining Machine Bits. Worn bits are easily replaced. Bit diameter is 6½". Prices, exclusive of cutting inserts, range from $50.80 to $58.40, depending on quantity. Available with square, hex. or splined shank.

**KENNAMETAL STYLE FS** "Finger" Bits drill laminated sandstone, medium limestone, and other medium ground that is usually considered too hard for rotary drilling. Lengths range from 2⅝" to 3¼", prices from $1.10 to $1.50, depending on bit size and quantity.

## Bits for Special Drilling

**STYLE SD-3¼" BITS** are used to drill holes for airdox or cardox. Its adjustable core breaker is screwed in as the bit wears — to give it new bit drilling efficiency throughout its entire service life. The bit drills smooth, straight holes in coal or rock. Bit diameter is 3¼". Prices range from $33.00 to $39.60 depending on quantity. Available with square, hex. or splined shank.

**KENNAMETAL HITCH BITS, STYLE HCTS,** are used to drill three foot holes and one and one-half foot holes on opposite sides of the rib, so that timbers can be installed. Cutting edges are rugged Kennametal Finger Bits. The hitch bit requires at least a 5 h.p. power unit. Bit diameter is 9½". Prices, exclusive of the finger bits, range from $120.00 to $130.00, depending on quantity.

**STYLE STRA** "Chopping Bits" gives big chunks of rock and ore formation. This 2⅝" bit is used on the iron ranges for exploratory work and for blast hole drilling.

It is used as a chopping bit with light well drill rigs and recovers core in an extra heavy 2½" pipe that is used for the drill rod. Diameter 2⅛". Prices from $22.55 to $32.30 depending on quantity.

**KENNAMETAL DRAG (STYLE DG), AND CORE (STYLE XC) BITS** are commonly used for drilling through medium hard and hard substances. Drag Bit diameters range from 1½" to 3". Prices are from $21.55 to $60.40, depending on bit size, and quantity. Core bit diameters range from 1⅞" to 2⅝". Prices are $14.45 to $33.45 depending on bit size, and quantity.

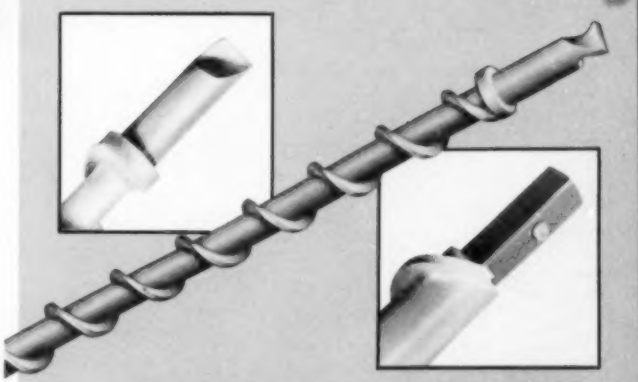
## Kennametal Augers

Kennametal Augers are fabricated of high quality steel. They have solid centers in small diameters and hollow steel tube centers in large diameters. The spiral is a medium carbon steel scroll that is uniformly machine-welded on the rod or tube and flame hardened to provide a smooth and long wearing conveying surface. Sockets for augers are described on next page.

Twisted shank augers are used for post or machine mounted drilling or for hand-held drilling. Drilling delays due to auger changes are minimized. Snap-button shank augers are used primarily with post-mounted drills to eliminate the necessity of backing up the augers when one auger length has been drilled up and additional auger length is necessary.

Tapered shank augers and sectional augers with special couplings, are also available.

Twisted shank augers are available in diameters from 1⅝" to 2½", lengths from 3 ft. to 15 ft. Prices are $10.75 to $43.75, depending on size. Snap-button shank augers are available in diameters from 1⅝" to 2½", lengths of 3 ft. and 4 ft. Prices are $13.75 to $19.30, depending on size.



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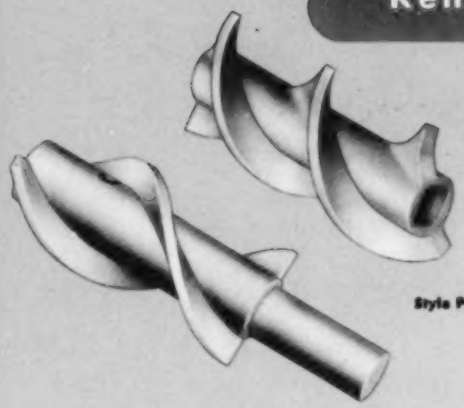
LATROBE, PA.

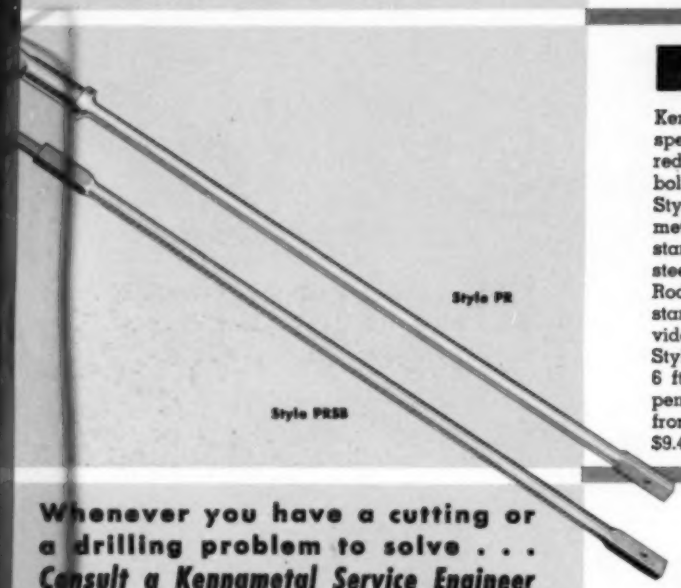


Style P

Style Q

## Kennametal Adapters

Style P Adapters are used to convert solid-center augers to use Kennametal Auger Bits. Style Q Adapters are used to convert tubular construction augers to use Kennametal Auger Bits. The adapters are made of alloy steel tubing and high tensile strength steel scroll. Style TR twisted shanks are used for converting solid-center augers so they can be used with Kennametal drive sockets. Style TP twisted shanks are used for converting tubular constructed augers so that they can be fitted into Kennametal Drive Sockets. Style P price is $4.15. Style Q price is $4.95. Styles TR and TP are each $4.15.



Style PR

Style PRSB

## Kennametal Drill Rods

Kennametal Pinning Rods for Roof Bolting are special and original Kennametal designs that reduce auger cost and handling weight when bolt holes are drilled with the Kennametal RD Style and FD Style Roof Drilling Bits. Kennametal Rods and Bits make bolting possible with standard coal drills. They are high quality steel rods that give dependable drilling service. Rod shanks are of the twist style, and fit into standard Kennametal drive sockets, being provided with chucks to hold RD and FD Bits. Style PRSB is available in lengths from 1 ft. to 6 ft., prices ranging from $8.20 to $10.20, depending on size. Style PR is available in lengths from 6 in. to 6 ft., prices ranging from $7.20 to $9.40, depending on size.

**Whenever you have a cutting or a drilling problem to solve . . .**
***Consult a Kennametal Service Engineer***

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Phone 3796

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Style BR

## Kennametal Drive Sockets

Drive sockets are furnished in standard styles to fit all commonly used drills. The part is an auxiliary for connecting the Kennametal Auger to the drill or thread bar. Chucks fit either twisted shank or snap-button shank augers. In certain sizes, sockets for post and mounted drills are available either with or without the safety sleeve. Sockets are made of tough, high quality seamless alloy steel tubing and are heat-treated to give maximum service life. The socket will last for long periods of time, and take plenty of rough handling and hard service. Thread diameters range from 1.160" to 1.687"; prices from $12.40 to $19.80.

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*BULLETIN 5025 gives information on "How to order Wire Rope" and lists all sizes and constructions of Improved Plow Steel Monarch Whyte Strand Wire Rope. Copy sent on request.*

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## Seven Basic Reasons

### WHY THIS MILL MOTOR WILL SET NEW STANDARDS OF PERFORMANCE IN YOUR PLANT

**1. BETTER COMMUTATION:** Brushes with ample current-carrying capacity—properly designed commutator—specially shaped commutating pole faces.

**2. UNIT ASSEMBLY OF FIELD COILS:** Formed coil completely insulated and then assembled on a steel shell to protect coil from grounding or chafing against the pole.

**3. HIGHER MAXIMUM SAFE SPEEDS:** Anchoring of armature coils with individual wedges permits safe operation at higher speeds—no core bands to come loose and cause trouble.

**4. HEAVIER AXLE STEEL SHAFT:** Larger in diameter between the bearings, on horsepower basis—made possible by mounting punchings directly on the shaft which is removable.

**5. RIGIDLY MOUNTED COMMUTATOR:** Bridge construction supports each end of commutator on shaft—no overhang.

**6. CAST-ALUMINUM FAN:** One piece—large diameter provides a plus in cooling.

**7. LOW-INERTIA ARMATURE:** Allows motor to start, stop and reverse with minimum stored energy.

# Look— No Core Bands!

## Wedges give you the toughest mill motor built

Wedges, instead of bands, hold the armature coils firmly in place on the new Westinghouse Series 600 Mill Motor. This means a stronger armature that is capable of safe operation at higher speeds . . . increased motor efficiency.

Broken core bands are destructive, also core bands can cause damage to the insulation on armature coils during assembly. Wedges eliminate this risk—make winding a simple operation. Each slot has its own individual wedge . . . made of Class B material. Simplifies servicing and repair work.

Further, complete insulation of the armature provides maximum electrical strength. Mica wrapper and glass tape protect the conductor. Complete armature assembly is impregnated with thermoset varnish. All this adds up to a rugged armature for a strong motor—built to handle your toughest jobs.

There are many more advantages offered by this mill motor that you will want to consider. Your Westinghouse representative has all the facts. Ask him for your copy of Booklet B-4730. Or write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21646

YOU CAN BE SURE... IF IT'S

**Westinghouse**

**MILL MOTORS AND CONTROLS**

# Rome 60 Mining Cables

## ARE DESIGNED FOR rugged service

***Interlocking of Conductors to Sheath Prevents Failure from Twisting, Bending and Pulling***

*P-105 BM molded in the Neoprene sheath is your assurance of compliance with Federal and Pennsylvania Safety Codes.*

*The grounding conductor is solidly embedded in a Neoprene "web" giving exceptional protection against "shorts" and mechanical injury, yet maintaining flexibility and minimizing conductor distortion and fatigue.*

*Note how the open braid around each conductor firmly interlocks conductors to sheath . . . prevents twisting, loosening and pulling.*

We never thought of calling it an "improvement" . . . such things are routine with Rome Cable . . . but Rome 60 Mining Cables have long been manufactured with insulation "geared" to a Neoprene sheath. A strong reinforcing open braid interlocking individual conductors to the sheath provides 360 degrees of balanced adhesion. With this integrated construction twisting or loosening of conductors within the sheath is eliminated.

What's more, the open braid construction does not reduce sheath thickness . . . leaves plenty of room for a tough resilient Neoprene "web" between conductors. This means high resistance to impact, unusual flexibility and reduced danger of "shorts." There are no fibrous "separators" to rot, deteriorate or wick moisture.

Molded in lead to a tire-like toughness, the Neoprene sheath has exceptional resistance to abrasion, acidulous waters, oils and flame. The heat resistant rubber insulation, suitable for operation at 75° C., gives you greater overload protection. Result? A cable designed for rugged service with assurance of long, dependable service life.

You can reduce production costs by standardizing on Rome 60 Mining Cables.

**ATTEND THE CLEVELAND**

**COAL SHOW**

**MAY 14 - 17**

And, while there see our display of better Rome 60 mining cables. Rome Cable personnel will be happy to discuss your cable problems or just sit and visit.

In any event, stop and say hello. We will be looking for you.

**BOOTH 1209**

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**The Rome 60 Line Includes:**

- Type SO Portable Cords
- Single Conductor Locomotive Cables
- Concentric Mining Machine Cables
- Twin (Parallel Duplex) Mining Machine Cables—Types W and G
- Multiple Conductor Portable Power Cables Types W and G
- Shot Firing Cord
- Remote Control and Drill Cable
- Mine Power Distribution Cable
- Shovel and Dredge Cables

***It Costs Less To Buy the Best***

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From Bar to Finished Wire

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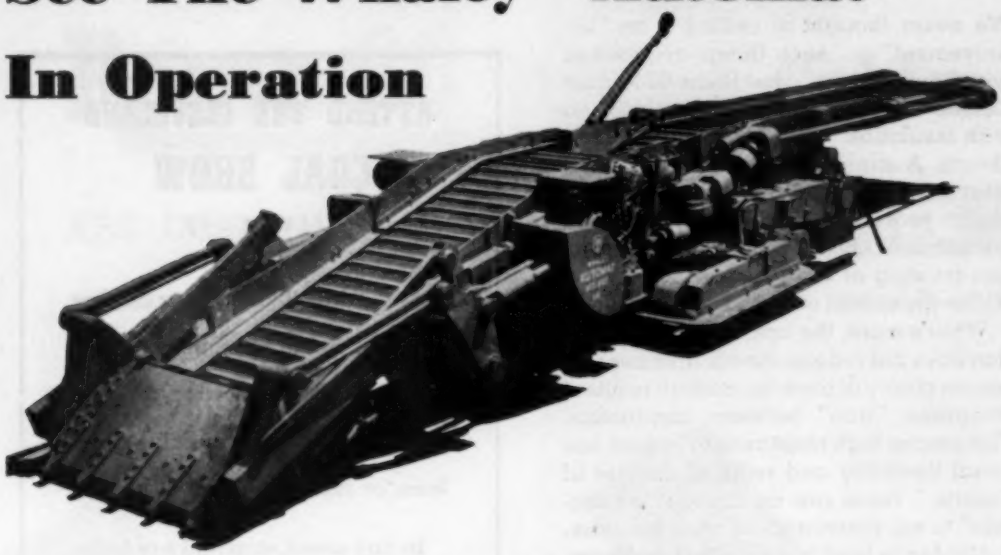
# See The Whaley "Automat" In Operation



## See the Efficient, Smooth Running "Automat" L-S at the 1951 Coal Show . . . Booth 1612

**For the first time in several years, we will demonstrate our Low Style "Automat" loading machine at the 1951 Coal Show. This machine will be complete with all improvements of recent years including its automatic lubrication system.**

**To understand the effectiveness and simplicity of the "Automat" . . . to appreciate its smooth running yet rugged ability for consistent service, you should watch it in service. The next best move is to see it demonstrated at the coal show. To those coal mining men especially who are attending this show for the first time, don't fail to visit our Booth No. 1612. It's your best opportunity to investigate every detail of the "Automat."**

# MYERS-WHALEY

**"MECHANICAL LOADERS EXCLUSIVELY FOR OVER 40 YEARS"**

# MINING MACHINE CABLES

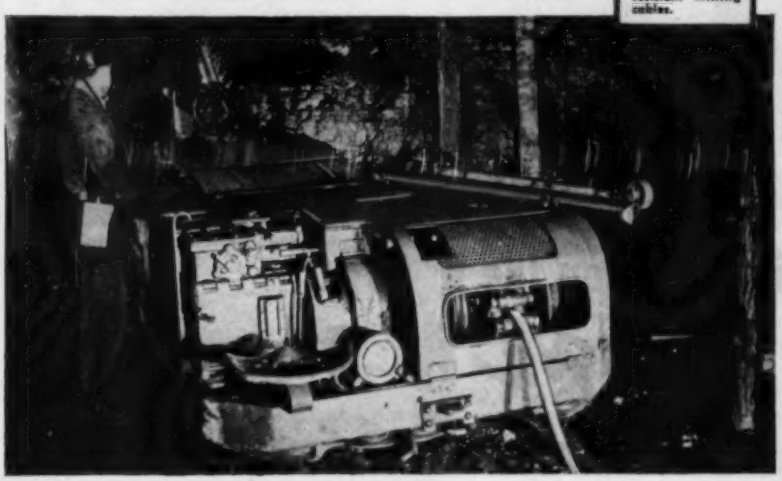
***For cables that stay on the job longer . . .***
***ROEBLING!***

THE JACKETS of Roebling Roeprene Mining Machine Cables are "lead-mold" cured to assure that all components of the cables are firmly held in place. The finished product has exceptional dielectric and physical strength . . . the tough outer surface is highly resistant to water, sunlight checking, acids, alkalis, oil and grease.

But more than that, every feature of these cables contributes to maximum flexibility and service life. Their neutral, for instance, is made of flat, braided copper which provides the ultimate in elongation and flexibility in any direction. And the neutral is covered with braided cotton to cushion and reduce abrasive action between copper and insulation. Service experience has proven this Roebling design so effective that it is now being widely imitated.

Large quantities of Roebling's full line of electrical wires and cables are called for in the national rearmament program. The Roebling organization and distributors will always, however, give you the best service and deliveries within their power. John A. Roebling's Sons Company, Trenton 2, New Jersey.

Conductors are tinned or Amalay-coated copper . . . extra flexible stranded.
Insulation RH—RW made of heat- and moisture - resistant synthetic rubber.
Reinforcing open seine twine weave on each individual conductor bonds the insulation and the jacket into one integral unit . . . provides greater flexibility . . . greater resistance to wear.
Jacket is lead-cured Roeprene . . . meets ASTM specification D-752.
All Roebling Roeprene Mining Machine Cables are approved by the Pennsylvania Bureau of Mines Approval P-111, and comply with the requirements of the U. S. Bureau of Mines for flame-resistant mining cables.
RIM-FM ROEBLING AWM 1651



# ROEBLING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*Armored* to resist highly abrasive conditions, Wire Countered Primacord is recommended for use as *down* lines in deep, ragged holes. The wire countering increases the tensile strength of the Primacord, and gives it added protection during loading operations.

The four grades of Primacord enable the blaster to meet every condition encountered in coal stripping, open-pit mining, quarrying, pipe-line river crossing, marine work, coyote tunnels, etc. Flexible, easy to hook up and handle, waterproof and insensitive to stray electrical currents, Primacord is the ideal detonating agent — the modern way to better output, greater economy.

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

MAY, 1951

IVAN A. GIVEN, EDITOR

# Results-Getter No.1

WORKING HARD is one way of getting things done. Working smartly is the second—and best. It gets results easier, more efficiently and at a lower cost. At the same time, it reduces physical and mental drudgery and thus provides a better opportunity for creative thought and planning. Working smartly, therefore, has everything in its favor and nothing to its detriment.

What constitutes smart work? First, it's knowing exactly what the job is and what the conditions are that must be met. Second, it is careful choice of methods for doing the work efficiently and safely. Third, it is calling on machines and materials for the utmost in cutting cost and building quality.

Rolled up together, smart work is getting and using ideas—about conditions, about methods, and about equipment and materials. Not the least of the sources for ideas are the American Mining Congress Coal Shows. The 1951 Coal Show reaches a new high in idea opportunities. Attend if you can. If not see the June *Coal Age* for a digest of the convention proceedings and exhibits. In any event, make working smartly your keynote to accelerated progress and an even-better future.

# Summer Scrape

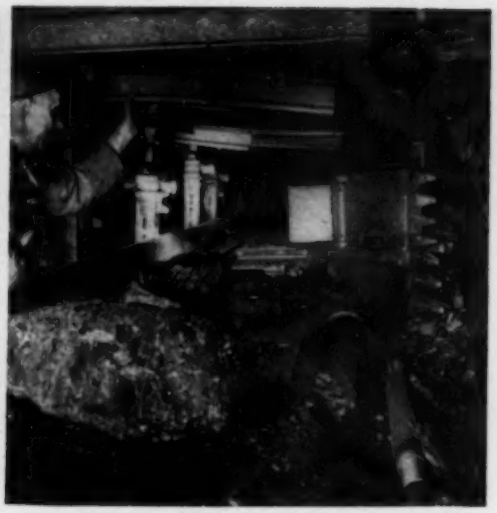
THOUGH it might not seem so at the moment, all the signs indicate that coal will have to wrestle with a real transportation headache this summer and the remainder of the year. Hopper cars, in other words, are going to be at a premium in the very near future, and the judgment of at least part of the experts is that only the utmost in planning for the use of available hopper equipment will prevent chronic and perhaps very-severe mine tieups. This results from plans to move a maximum of 5,000,000 tons of ore down from the iron country in hopper cars this year to supplement ship deliveries to the Lower Lake ports, with special provisions for grain movement as an added complication in the situation.

If this program is carried through, there will be a summer scrape in rail transportation. The carriers and the government have the major headache, but the effects will fall on coal mines in addition to other users of hopper equipment. Now is the time to begin thinking about helpful measures, including prompt loading at the mines and prompt unloading at destination.

# Key Way Out

AMONG THE PROBLEMS for coal now and in the future is manpower. This problem is both one of numbers and, perhaps even-more critical, of quality. Raiding of manpower is an inescapable part of pinch conditions such as those apparently imminent if not already with us, and coal will feel the effects increasingly. These effects include not only a reduction in the number of men available but, more importantly, in the skills necessary for efficient, low-cost coal production.

Thus coal, along with many other industries, is faced with the problem not only of acquiring and holding men but also of acquiring needed skills. The logical answer to the latter is training, both of new employees and men already on the job. This is not to say that much has not been done. Rather it is to point out that the need promises to be greater than ever and that a definite program is essential. Among other things, since most coal companies cannot run individual programs, it is logical to consider training centers serving all companies in a given area. Since training is the key way out of both present difficulties and the problem of providing the mining specialists the industry will need more and more, there is need for concrete action now.

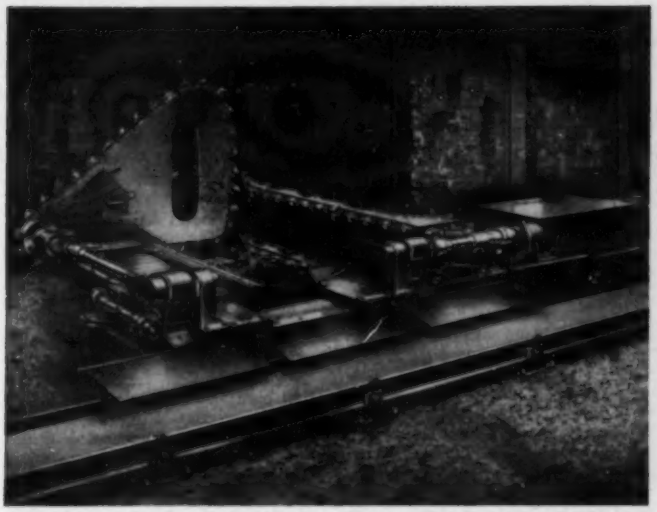


NEW RECRUITS in the cost-cutting ranks are the British stripper (left), German coal planer (right), and the British cutter-loader (opposite page), all scheduled for early trial in thin-seam mining in the U. S.

# What's Ahead in Coal Mining

## Cost Reduction Still the Major Problem
## Higher Productivity per Man the Answer
## New and Better Machines the Means

ADDED POWER AND RANGE expand the cost-cutting possibilities of conventional stripping equipment, such as the dragline at the left, and permit other equipment formerly used largely as auxiliaries, such as the bulldozer (right), to undertake complete stripping.



SEMI-LONGWALL METHODS apparently are headed for wider use in the U. S. if trials of such machines as this cutter-loader are successful.

PITCH-MINING POSSIBILITIES include drilling big holes and shooting pillars.

A LOOK AHEAD in coal mining shows no change in the big problems still confronting the industry. Real progress has been made but coal nevertheless must continue to wrestle with long-standing operating, sales, labor and other questions. Not the least of these is cost. It is the key to accelerated progress and in turn reflects mining efficiency.

What, then, is the trend in thinking and practice on higher efficiency and lower cost? But before that, what has coal accomplished to date? Consider these figures:

**Bituminous Mining**

| | Tons per Man-Shift | | |
|---|---|---|---|
| | Strip | Deep | Overall |
| 1930.... | 13.92 | 4.94 | 5.06 |
| 1949.... | 15.33 | 5.42 | 6.43 |

**Anthracite Mining**

| | | | |
|---|---|---|---|
| 1930.... | 7.84* | 2.05* | 2.21 |
| 1949.... | 6.77 | 2.36 | 2.87 |

* Estimated. Anthracite strip figures include dredge coal and coal reclaimed from refuse banks.

● **Where the Opportunities Are**—Analysis of the productivity situation shows that the major opportunity for increasing tons per man and cutting cost is in direct mining, particularly at underground operations. A second, though not as great, is in improving service efficiency.

A 1949 survey of properties producing more than 9,000,000 tons per month showed the following for service labor: 100% mobile loading, 18.0 tons per man; 100% hand loading, 17.9; and mines with a combination of hand and mechanical loading, 17.6 tons. On the other hand, tons per man for direct mining labor, mobile-loading mines was approximately 14; hand-loading, approximately 7.

In stripping, productivity was over 30 tons for service labor, nearly 50 tons for direct mining labor, and 19 tons per man overall.

Thus, the conclusion is that concentration on direct mining offers the maximum possibilities in cost reduction at underground operations. For example, on an average daily wage of $17.60, raising the productivity of service labor in deep mines from 17.6 to 20.0 tons would reduce operating costs 12c per ton, while raising direct mining productivity from 7.4 to 10.0 tons per day would cut operating costs 63c per ton.

With the goals as higher efficiency in both direct mining and service, the coal-mining trend is in the following directions:

## Stripping

Because stripping represents use of machinery to a major degree, and because this equipment, by and large, makes use of obvious operating principles, startling changes are not to be expected. In fact, about the only logical next step will parallel the development in deep mining, namely, the construction of machines that can dig overburden out of the solid in addition to spoiling it. That, however, apparently is not something for tomorrow.

Pending development of a stripping unit that can do its own digging in any kind of material encountered, open-pit production will continue to rely largely on shovels, draglines and other earth-moving equipment of the types presently in service. For shovels and draglines, additional gains in dipper and bucket size, in cycle speed, and in digging and spoiling range will be made, though relatively slowly in view of the fact that these gains involve the possibility of even-greater gains in equipment cost. However, the margin of stripping over deep mining leaves considerable room for increased investment per unit.

This same margin, plus the increased efficiency of modern equipment, also favors expanded use of dragline equipment alone or in combination with shovels. Other equipment also lending itself to tandem operation includes scrapers, bulldozers, tower excavators and wheel excavators. All these, to a certain degree, are capable of doing their own digging, with the wheel excavator approaching the ideal of continuous digging and disposal at relatively high rates and over long distances where the

overburden is not too hard to dig.

Increased power and speed also are widening the opportunities for equipment hitherto considered largely as auxiliaries, though used for complete stripping in the past. The scraper, for example, entered this group some years ago. The bulldozer also has been used and now its range has been expanded to the point where successful handling of overburden up to 50 ft and containing 50% or more rock is possible.

● **Spoil Transportation** — Though the ideal in overburden handling is digging and spoiling in one continuous cycle, the need for handling thicker material has stimulated study of the possibilities of spoil transportation. Anthracite was perhaps the pioneer in spoil haulage and recently has put the practice solidly on the map for a substantial part of its open-pit output—and in so doing has contributed greatly to the design of heavy-duty trucking equipment.

Spoil haulage with automotive equipment also is increasing in the bituminous industry, in addition to rehandling with conventional units, though, in view of the relatively lower price of the product, the emphasis still is on casting. With enough power in the tractor, a logical future step in spoil haulage is a wagon train.

A second method of transporting spoil is the stacker, which has been the subject of study and experimentation going back to the beginnings of the industry. The major difficulties have been capacity and big rock. Improvements in crushing equipment now offer the possibility of clearing up the rock difficulty, with units now envisioned large enough to take a full 60-yd dipper load, break it down to manageable size and feed it to the stacker belt in the time required for a single dipper pass.

● **Service Trends**—As in all other phases of stripping, the trends in service are directly related to the availability of increased power, as well as improvements in metals and design. This applies particularly to overburden drilling and coal haulage.

Improvements in vertical units, along with changes in the nature of the overburden, have again made this equipment a strong contender in the field of overburden drilling. One new dry-type unit, for example, eliminates the water problem and has averaged 53.24 fph of hole 6¾ in in diameter at one property where the burden contains a high percentage of hard material, including sandstone and limestone (February, 1951, *Coal Age*). Reports indicate that other new units will provide equal or greater footages with holes up to 9 in in diameter.

New high-speed engine equipment, permitting substantially higher horsepower in the same pulling unit, promise a major increase in truck and semi-trailer size. The 70-ton semi has been in existence for some years and recently has been coupled with 400-hp diesel (April, 1951, *Coal Age*) to achieve a low cost per ton-mile. With supercharging, the same engine can develop 550 hp. Torque-converter transmissions, not only in tractors and trucks, but in crawler and wheeled tractors, promise major maintenance savings, in addition to smoother, more-efficient operation.

## Deep Mining

The trend in deep mining of level or lightly pitching seams is definitely toward the wider use mobile-type continuous-mining equipment, with more than 100 units of three types in service and at least six other machines in the experimental stage or undergoing mine trials. Productivity per crew man is now up to 50 tons or better at some operations in medium-thickness coal, and new transportation units open up even-greater possibilities.

● **Auger Mining** — Offering relatively high productivity per man in a simple, relatively inexpensive machine, the coal-recovery auger already has made a place for itself in extending recovery from strip pits. Now, it is moving into underground mining for both thick and thin coal. As a result, it is undergoing modification and adaptation for underground service, including ability to bore both ways from one setting and also to bore top and bottom holes in the thicker coals. With complete new mines being laid out for auger recovery, particularly in the thinner seams, the auger seems destined for greatly increased use in deep mining.

● **Semi-Longwall Machines**—Since the thinner seams are being called upon for more and more of the country's coal production, it is natural that increased thought should be given to the problems of mechanizing these veins. Heretofore, about the only available equipment in the United States was the conveyor for thicknesses of 30 in or less, though increased attention is being given to the design of mobile loaders or continuous miners for this service. Recently, however, United States producers have turned their attention to foreign machines, with the result that at least three are scheduled for trial this year. One is a cutting-and-loading unit and the other two employ the planing or stripping principle.

All three are designed for use on semi-longwall faces, with the coal being placed on chain or belt conveyors paralleling said faces. If the trials are successful, semi-longwall operation, even though used to some extent for many years, will become a greater and greater factor in the production picture.

● **Service Haulage**—The advent of the continuous miner with its—initially—relatively lower rate of production, compared to the output of conventional loading machines, has really turned the spotlight on service transportation. The results apparently will include an expansion in the use of room, mother and special types of conveyors, the latter acting as the connection between the loader or miner and the room or mother conveyor or mine car. Four of the special connecting or intermediate-transportation units are:

1. The bridge conveyor, one end suspended from the tail boom of the loader or miner and the other end resting on a wheeled truck riding on the sides of a chain room conveyor (August, 1951, *Coal Age*).

2. The cascade conveyor, consisting of a series of short two-wheeled portable units.

3. The shaking-type extensible-retractible conveyor using a stainless-steel belt stored on a spool as the conveying member (April, 1951, *Coal Age*).

4. The recently announced articulated conveyor (see description, p 77 of this issue), mounted on rubber tires, self-propelled and designed to automatically follow a miner "snake-fashion" anywhere it goes, discharging to a mother conveyor or other transportation unit.

Performances being achieved with all these units promise a major improvement in service to loading machines and miners, and,

as a result, a major increase in tons per man.

Meanwhile, shuttle cars and mine cars increase in size for the thicker veins, with the trend definitely toward automatic coupling and bottom-dumping. At the same time, new designs extend the field of application in the thinner seams. Added starters include a new type of mine car—details still to be disclosed—and a tracklaying shuttle car. And where shuttle cars are being employed, considerable thought is being given to special intermediate transfer, or hopper, equipment mounted on crawlers or rubber and, in some instances, fitted with nesting conveyors for receiving the coal and feeding it to the regular shuttle cars.

The use of panel belts is steadily increasing and should receive added impetus from the installation of the new-type intermediate transportation units previously listed. Along with this growth is a growth in the use of main-line and slope belts, thus making production completely trackless and achieving the higher production per serviceman flowing out of efficient transportation by either belt or big mine cars, modern locomotives, good track and tight haulage control.

● **Power and Electrification**—AC for all mining operations apparently is destined for a steady growth in the future, which growth may be accelerated by increased conveyorization and the development of satisfactory alternate sources of power for locomotives and shuttle cars. Some of the alternates are:

1. Dieselization of track haulage. With the recent announcement of a new 10-ton diesel locomotive—apparently the first to be offered for U. S. coal mines—installation may be expected to get under way relatively soon, though a change in the safety code will be required.
2. Shuttle-car dieselization, now under development.
3. Combination diesel-electric and battery power for shuttle cars (August, 1950, *Coal Age*).
4. AC shuttle-car service through an M-G set on the car, now under development.

● **Roof Support** — Bolting has solidly established in the coal mining and will continue to build up until the maximum in application possibilities is reached. In addition to greater protection from falls, experience indicates substantial savings through a reduction in support cost plus increased output per loading unit and a result of better working conditions at the face.

Additional economies may be expected through the development of better drilling and bolting equipment, the trend being toward combination units that will both drill and install the bolt. The dust problem is being eliminated both by dry collectors and wet drilling, with developments in the latter category including new methods of using water on rotary equipment. One such is described beginning on p 74 of this issue. And for situations where normal-length bolts will not suffice, study is being given to telescopic and other special types where extra reach is necessary.

Experience to date indicates that where air-slackening is a problem, real help is gained from sealing with vinyl-plastic film (April, 1951, *Coal Age*).

● **Labor-Saving Auxiliaries** — In addition to increased capacity of production equipment all along the line and the introduction of new equipment and methods, including those previously summarized, a host of other auxiliary developments are aimed at conserving labor. Some examples are:

1. New portable cable-splicing unit (January, 1951, *Coal Age*).
2. Plastic, aluminum and other new forms of pipe for drainage.
3. Speed couplings for pipeline installation.
4. Vinyl-plastic for sealing stoppings (April, 1951, *Coal Age*).
5. Increased use of track-cleaning machines.
6. Installation of automatic controls wherever possible.
7. New-type car and trip feeders to eliminate lost time at transfer points.
8. Installation of automatic lubricating equipment on production machinery, including loaders and miners.
9. New-type alloy and tipped cutter and drill bits.
10. More-efficient pumps and fans.

## Pitch Mining

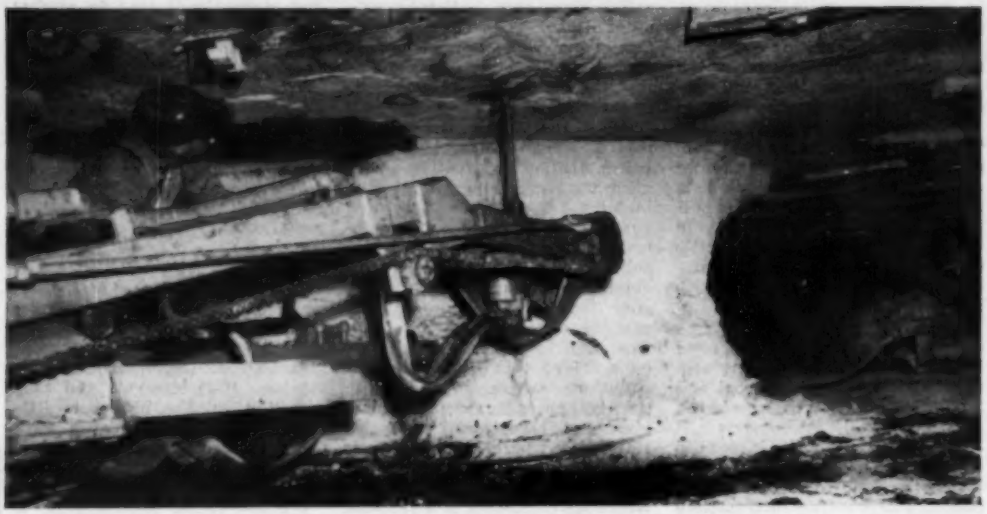
Natural conditions so far impose rather strict limitations on possible production equipment and methods for moderate- to steep-pitch mining. Thus, adaptation of the continuous-mining machine of the conventional type to pitches would require the addition of hoisting and lowering facilities, and would bring in the complication of extra passes in recovering the thicker veins. This is not to say that a machine or machines will not be developed eventually. For the present, however, the possibilities in new methods and equipment include the following:

1. Development of breasts by hand, followed by drilling and shooting of the pillars either by relatively short holes in each pillar or by long holes from the gangways through several pillars.
2. Augering on close centers.
3. Drilling large-diameter holes at, say, 10-ft intervals and then shooting out the pillars in lifts with smaller-diameter holes. Such equipment already is showing major cost savings in drilling crosscuts and airways in pitching coal (see description beginning on p. 100 of this issue of *Coal Age*.
4. Semi-longwall up and down the pitch with planer-type units.
5. Semi-longwall or chamber work down the pitch with the "heldiver", or scoop loader, up to approximately 50 deg. Such equipment already has proved itself in sinking slopes and quite probably could be adapted to production mining (see description elsewhere in this issue).

As noted, some of these methods and equipment units already are seeing actual service, and the indications are that others will receive field trials in the relatively near future, to be followed by adoption if results are satisfactory.

● **Development and Service**—Conveyors and mechanical loaders, including types specifically designed for gangway and tunnel work, are being increasingly used in developing pitching veins to reduce cost. Experiments also are being conducted on equipment for shearing, or cutting and shearing, in driving in coal.

With the increased use of loaders in development has come the wider use of new-type mounted drilling units, particularly for rock work. The economies thus achieved permit greater use of rock gangways and rock holes for development, thus cutting down the high cost of maintaining service entries in coal. The conveyor belt is moving more into the picture both for underground transportation and hoisting to the surface through slopes.



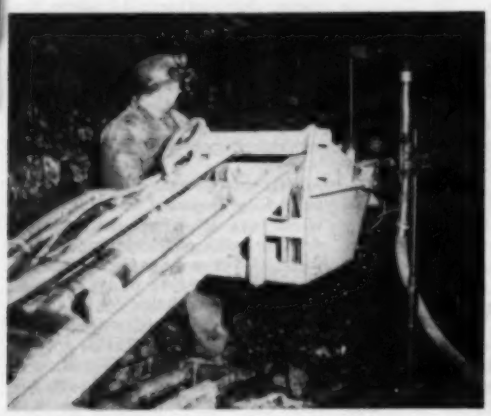
WET ROTARY DRILLING in action. Water is supplied through a special water swivel beneath the drilling unit, and goes up through the chuck and drill steel, escaping between the steel and the bit. It falls straight down without splattering the driller.

# Wet Rotary Drilling Improves Roof-Bolting Results

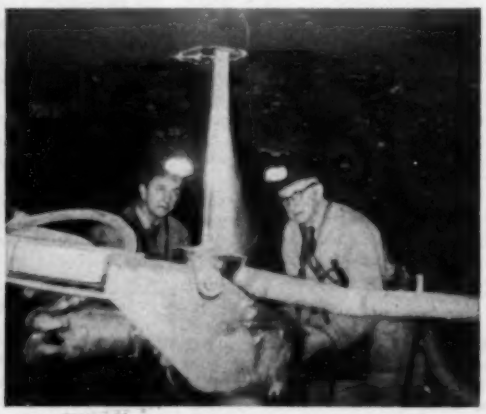
**Dust Done Away With — Bit Life Prolonged**
**Drilling Time Reduced — Driller Discomfort Eliminated**

By JOHN K. BERRY
Production Engineer, Consolidation Coal Co. (Ky.), Div. Pittsburgh Consolidation Coal Co., Jenkins, Ky.

HAVE YOU EVER gone to clean out your car and found some money under the front seat? Or straightened up the attic and come across a long-lost rifle or fly rod? It is a very pleasant and unexpected reward for performing a necessary



COLLAR COLLECTION of dry dust. Fan exhausts through trap and filter. Average dust count, breathing zone, under 5,000,000.



CHUCK COLLECTION of dry dust. Coarse material falls through openings in collector pan; hose removes fines; similar results.

duty. That is the nature of what happened to us in seeking some of the answers to problems encountered in drilling for roof-bolting at our operations.

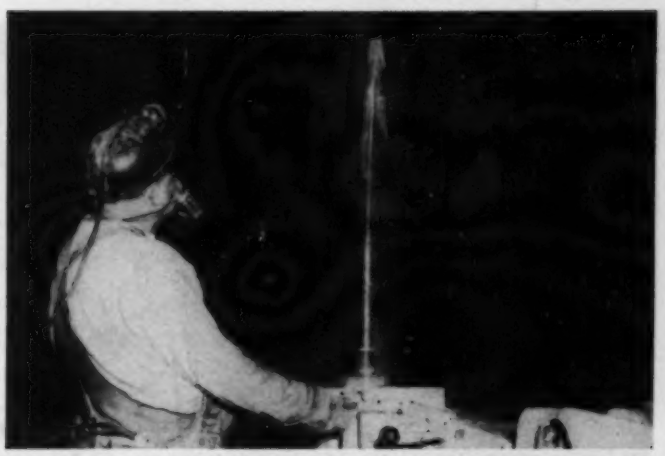
By the fall of 1949, Consol of Ky. was ready to replace all face timbering with roof bolts. Because of seam conditions, rotary drilling was far more suitable than percussion. Therefore, equipment was being developed along these lines.

Even though rotary drilling makes less dust than pneumatic percussion, the quantity still is substantial. Respirators were used during the experimental stage of roof drilling, but it has always been company policy to eliminate dust wherever possible, rather than guard against it. Therefore, attention was turned to the dust-suppression problem.

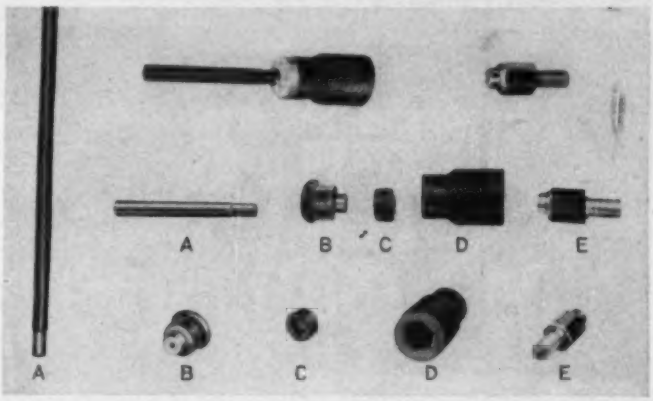
• **Dry Collection Tried First**—Because of previous experience with wet percussion drilling and its messiness, and because drill motors at that time were electric and might not stand up too well under a constant shower of water, initial dust-suppression efforts were directed toward dry collection. Another factor was that whenever water was encountered in the roof, there was a tendency for the drill cuttings to form a paste, eventually "freezing" the bit in the hole.

Effective results, as checked with an impinger at the breathing zone of the driller, were obtained by dry collecting at the collar of the hole and also at the chuck of the drill. With the latter, the need for time-consuming positioning of a collecting nozzle, which could be misplaced or even ignored, was eliminated. With both methods, however, an additional motor and blower became necessary in the absence of the venturi action of compressed air available with percussion drilling. This added to the size and cost of the roof drill. In addition, a filter requiring frequent cleaning was necessary to remove the fine particles, plus a dust trap for the coarser material, which also had to be emptied every few holes.

• **Water Swivel Developed**—More to eliminate wet drilling as a possibility rather than with too much hope of any success, a water swivel was made to fit between the first hydraulic drill motor and chuck put in service. The chuck was drilled, as was the shank of the hollow drill steel. There was sufficient clearance between the steel and the masonry-point tungsten-carbide bit for the water to flow. Several rubber gaskets were placed between the chuck and shank to prevent leakage at that point.



DRY ROTARY DRILLING was the original practice. By the time six or more holes had been drilled, the place was well-clouded with dust.

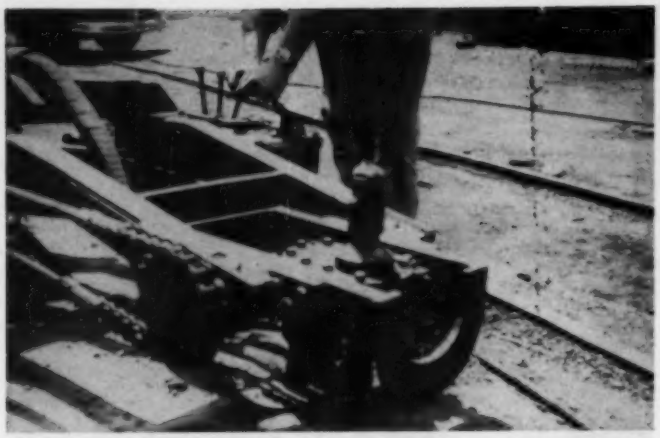



PARTS FOR WATERTIGHT CHUCK AND SHANK—hollow drill steel of any length, A, is welded into threaded top piece, B. Pipe gasket, C, is slipped onto smaller diameter shoulder of top piece, and both are screwed into end of female hex shank, D, which fits over male hex shank, E, with threaded spindle attached.

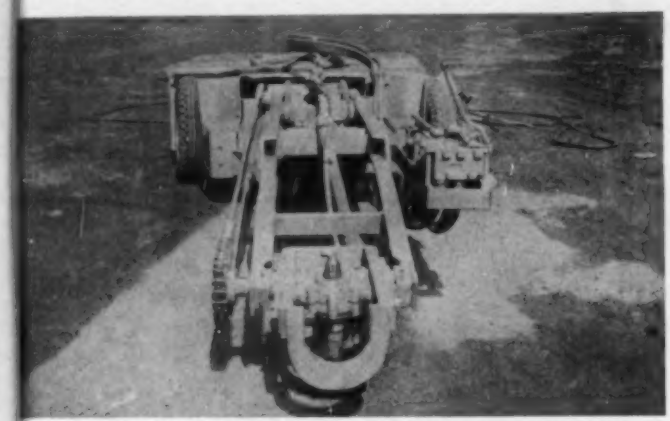
Instead of binding and hanging, as was feared, the water flushed away the cuttings and permitted 25% and up faster penetration, as it was no longer necessary to hold back the feed to permit the cuttings to fall clear. Once the hole was collared, the water fell straight down the steel without wetting the drill operator. The quantity of water, estimated at 2½ gpm, was not enough to damage either the coal or the bottom.

• **Swivel Design and Construction**—As a result of the preceding test, a refined-model water swivel was designed and built in the general shop. The swivel was placed on the bottom of the hydraulic drill motor to conserve drilling height and permit the use of only one rotating water seal instead of two. The drive shaft was drilled from swivel end to spindle seat.

The usual arrangement of female chuck on the drill and male on the steel was reversed for several reasons. The female chuck in the customary position would hold water and collect dirt, which would clog the hollow drill steel. Any leakage at the connection would squirt up and out into the driller's face. Over an inch of



DRILL WITH STEEL in drilling position. Rotation valve is pushed to "On," showing knife-edge between ball bearings, which opens water valve. In sections where hard streaks sometimes occurred and required 40 or more bit changes a shift, cooling action of the water has permitted drilling an entire shift with only one new bit.



COMPLETE ROOF DRILL, showing controls, male chuck and water swivel beneath. No height is wasted, as hydraulic hoses need same clearance beneath drill.

drilling height was saved, as the female chuck has to be above the spindle connecting it to the drive shaft.

The male chuck and spindle, drilled axially, screw into the drive shaft and are readily replaceable in case of wear or breakage. A hex shape was used to provide better steel alignment and to transmit all the drilling torque, reducing wear on the gasket seal. Upward thrust is transmitted by the shoulder of the chuck. Therefore, the gasket is only snugly compressed by the rounded nose, making a watertight seal but cutting down the wear.

The female member is composed of three parts. The bottom piece is female hex at one end to fit the male chuck, and rests on its shoulder. The upper end is threaded for assembly with the top piece which is welded to the hollow drill steel. The threaded end of the top piece has a projecting nipple of a smaller diameter, on which is placed a Victualic pipe gasket, which fits inside the threaded end of the bottom piece. By making the shank in three pieces, worn gaskets may be easily replaced, and since drill steels are subject to breakage, a supply already welded to the light, inexpensive upper piece, may be kept with the drill for replacement.

Results have been so satisfactory from this design of chuck that application for a patent has been made.

• **Water Control**—No change was found necessary at the drill end of the steel and water is permitted to flow into the hole around the cotter pin and shoulder of the bit.

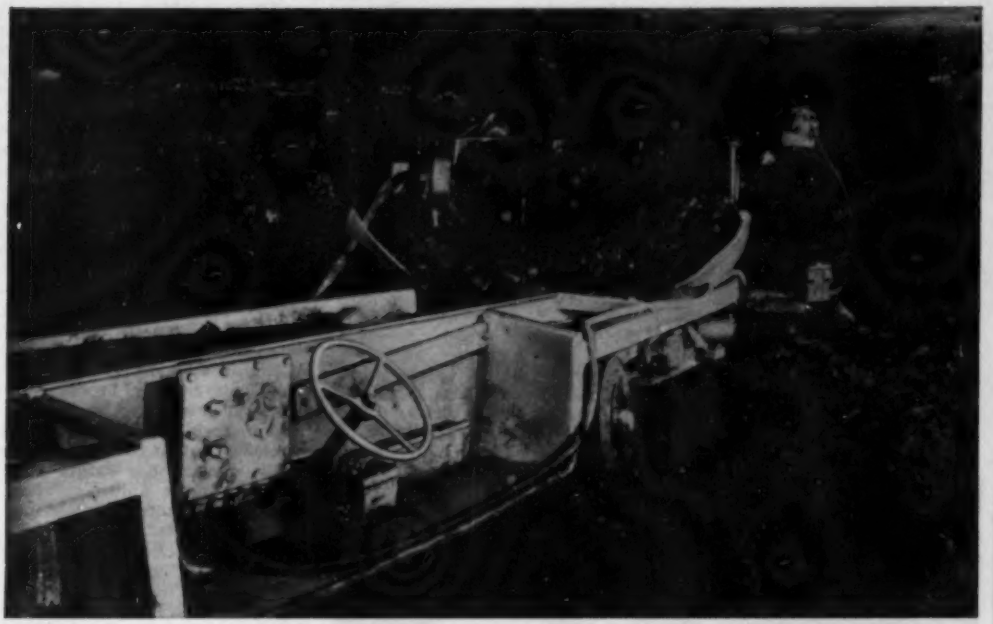
To insure positive water use, a quick-acting water valve is operated by the drill-rotation lever. A knife-edge is welded to the rotation handle. When the lever is pushed into the "On" position, the blade pushes between two ball bearings. This opens the valve.

The rotation valve also will operate by pulling as well as by pushing. When pulled, rotation is secured without water. This is necessary to collar the hole, since, until the water outlets are up in the roof, the water would be swirled about like a lawn sprinkler. In addition, water would leak out the chuck when rotation was desired to clean the hole while lowering the bit, at which time there would be no pressure against the roof to hold the seal. The pulling motion, however, is sufficiently awkward to discourage any tendency toward drilling the entire hole dry.

A globe valve is placed outby the water valve to regulate the quantity used. Fast-drilling roof requires more water to flush the cuttings away. A trap filter, to keep the system from becoming clogged, is next in line, followed by a quick-connector for attachment to the water line. Since water is carried to every working face for use on cutter-bars, there is scarcely any extra cost involved, as chucks and steels must be used wet or dry.

• **Multiple Savings Secured**—In addition to the savings from faster penetration, an even-greater saving came to light in service. At times, hard streaks occurred locally in the top. When these were encountered it was not uncommon to ruin one bit per hole. The friction heat generated in trying to penetrate the streak was enough to melt the carbide insert from its holder.

When sections drilling 50 to 60 holes per shift required 40 or more new bits, the cost was enough to lead to serious consideration of abandoning roof-bolting entirely in these areas. One never knew whether the condition would last a shift, a week, or indefinitely. The cooling action of the water has corrected this difficulty and, under the same conditions, one new bit per shift will now suffice.



NEW INTERMEDIATE-TRANSPORTATION UNIT in action receiving coal from the continuous-mining unit. Muddy bottom is no hindrance. The receiving unit feeds to one or more intermediate sections and then to a discharge section feeding to the main haulage equipment.

### New Self-Propelled Rubber-Tired Conveyor Train Provides . . .

# Continuous Transportation

**Goal:** More Production Time for the Continuous Miner by Reducing Transportation Delays

**Solution:** New Intermediate-Transportation Unit That Follows the Miner Automatically at All Times

By C. H. SNYDER
President, Sunnyhill Coal Co., Pittsburgh, Pa.

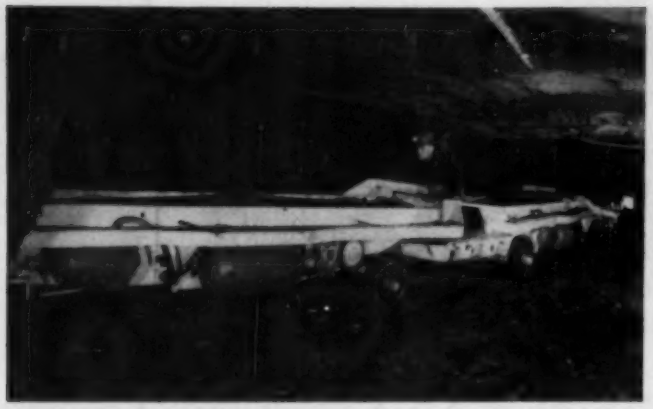
CONTINUOUS MINING, with the coal dislodged from the face and carried in a continuous stream to the surface, has been a mining dream for over a century and a half. The first step logically was the development of a rugged machine that could do its own mining out of the solid in addition to loading. That, I believe, everyone will agree, we have.

As the data to be presented in this article indicate, however, lack of a continuous transportation medium has heretofore made so-called continuous mining in fact intermittent mining. In short, we have high producing capacity but low transporting capacity. Just as the proverbial chain is no stronger than its weakest link, so continuous mining, as the record shows, is no better than its weakest link: intermediate transportation.

What are the prospects now? In a recent test run on a new intermediate transportation unit, the operator of the continuous-mining unit left his seat to chat with a number of us who were watching the test. The machine continued to mine coal at a rate of 2½ tons per minute. No one was touching the intermediate-transportation unit, which was advancing behind the machine automatically at a rate of 6 in per minute, or each time the machine had advanced the face that distance. Coal was moving in a continuous stream, and without spillage, from the face to the mother conveyor and out the mine portal—with no human hand touching any machine or control. It was really something to see—a dream come true. Little wonder that those of us present agreed that the coal dust inhaled that afternoon was the best coal dust any of us ever tasted.

• **Coal Movement the Problem**—The new intermediate transportation unit with which this article is concerned has been christened the "Molveyor." It was developed in conjunction with the Jeffrey Mfg. Co. as the answer to the trans-

## Operating Experience and Results With New-Type Conveyor Train



INTERMEDIATE BELT SECTIONS are designed to track exactly with the receiving end in "snake-fashion" to provide continuous transportation behind the mining unit.

DISCHARGE END of the new intermediate-transportation unit includes a swinging boom for placing the coal on a mother belt or other transportation unit.

### Continuous-Miner Operating Record Showing Transportation and Other Time Lost

| | Seam Height | Tons Loaded | Total Buggies | Time to Load Car Min. | Max. | Avg. | Waiting on Cars Min. | Max. | Avg. |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 17.... | 38" | 169.11 | 95 | 56" | 4' 35" | 1' 30" | 26" | 5' 21" | 1' 14" |
| Oct. 18.... | 38" | 183.34 | 99 | 50" | 3' 44" | 1' 25" | 34" | 4' 2" | 1' 15" |
| Oct. 19.... | 38" | 198.88 | 100 | 49" | 2' 40" | 1' 14" | 32" | 3' 21" | 1' 18" |
| Oct. 20.... | 38" | 255.10 | 126 | 43" | 2' 32" | 1' 8" | 31" | 3' 14" | 1' 16" |
| Average.. | 38" | 201.60 | 105 | 43" | 4' 35" | 1' 19" | 26" | 5' 21" | 1' 16" |

| | Total Machine Operating Time | Total Time Waiting for Shuttle Buggies | Lost Time, Other Reasons | % Face Time Actually Operated | % 8-Hr Shift Actually Operated | Tons per Man* |
|---|---|---|---|---|---|---|
| Oct. 17.... | 2 h 23' | 1 h 57' | 1 h 10' | 43.3 | 29.8 | 28.18 |
| Oct. 18.... | 2 h 20' | 2 h 3' | 1 h 7' | 42.4 | 29.1 | 30.55 |
| Oct. 19.... | 2 h 3' | 2 h 9' | 1 h 18' | 37.2 | 25.6 | 33.14 |
| Oct. 20.... | 2 h 24' | 2 h 31' | 1 h 35' | 43.6 | 30.0 | 42.50 |
| Average.. | 2 h 17½' | 2 h 10' | 1 h 2½' | 41.6 | 28.6 | 33.59 |

*Men charged to operation: Colmol operator, Colmol helper, two shuttle-buggy operators, one mechanic, one loading-boom operator; total, six.

portation problem encountered when we began using the Colmol, developed by Sunnyhill and now being built and distributed by Jeffrey, in underground mining.

The Molveyor provides a method of taking the coal from the Colmol in a continuous steam. It consists of a train of belts mounted on frames equipped with rubber tires. The Molveyor operates "snake-fashion" between the Colmol and the main transportation system in headings, crosscuts or rooms, and around one or more corners.

The Colmol now is available in two models, for high and low coal. Mining is done by two rows of expandable breaker heads using rotary-type mining units. The breaker heads are designed and positioned so that the Colmol cuts a hole considerably larger than the body of the unit. Therefore, the crawler-mounted machine may freely move into and out of the hole it has cut. Part of the heads turn clockwise and part counterclockwise so that coal is dislodged from the face and swept to the center of the machine, where a conveyor picks it up and carries it up and to the rear. The two models now available have the following specifications:

MODEL A

| | |
|---|---|
| Cutting height, min..... | 33 in |
| Cutting height, max..... | 50 in |
| Cutting width..... | 9 ft 6 in |

MODEL B

| | |
|---|---|
| Cutting height, min..... | 45 in |
| Cutting height, max..... | 72 in |
| Cutting width..... | 10 ft |

Since the first Model B machine only recently left the factory, there is obviously no operating data on this larger unit. Consequently, the performance data which follow are limited to the low, or Model A, machine. It weighs 25 tons and is powered by three 50-hp motors. Length is 23 ft 9 in, width over the crawlers behind the breaker heads is 73 in, and the height with the heads completely collapsed, is 25 ⅝ in.

• **Mining Results**—Data on a four-day consecutive operating period for a Model A Colmol mining 38 in of coal is shown in the accompanying table. Room work was being done at the time, and these rooms were driven 275 ft deep and approximately 14 ft wide. After turning the room neck from the heading, the machine would advance 30 to 40 ft and then tram back and take a lift cut 8 ft wide

for a distance of 50 to 80 ft. This process was repeated until the room reached its full depth. The machine then was brought back to the room neck and two successive 8-ft lifts were made the full 275-ft room depth. Post lines were maintained within 10 ft of the rib on the final lift cut.

In retreating, following the last lift cut, crosscuts were driven at 90 deg approximately 30 ft through the pillar for ventilating the next room as it is advanced.

Two shuttle cars were used for intermediate haulage from the machine to the panel belt. The cars passed each other enroute. The low seam prohibited the use of a surge car

A comparative size consist of the rather friable coal from this mine, Colmol v conventional mining, is as follows:

| | Colmol | Conventional Mining |
|---|---|---|
| Plus 2-in | 8.7% | 12.6% |
| 2x1 | 14.3% | 14.4% |
| 1x¼sq | 28.0% | 29.2% |
| ¼x¼ | 14.2% | 15.1% |
| ¼x10-mesh | 8.7% | 9.2% |
| 10x20-mesh | 7.8% | 7.6% |
| 20x28-mesh | 3.8% | 2.9% |
| 28x48-mesh | 5.6% | 3.9% |
| Minus 48 | 8.9% | 5.1% |
| | 100.0% | 100.0% |

In another mine where the coal is very hard in structure, comparative size consist—Colmol, conventional underground mining and stripping—is as follows:

| | Colmol | Conventional | Strip |
|---|---|---|---|
| Plus 2-in | 31.0% | 38.7% | 58.1% |
| 2x1 | 14.1% | 16.2% | 15.8% |
| 1x¼ | 28.5% | 23.4% | 18.0% |
| ¼x8-mesh | 13.5% | 9.4% | 4.0% |
| 8x16-mesh | 5.0% | 5.1% | 1.2% |
| 16x30-mesh | 4.2% | 3.0% | 1.2% |
| Minus 30 | 3.7% | 4.2% | 1.7% |
| | 100.0% | 100.0% | 100.0% |

An accurate reading of Colmol power consumption at this mine producing 2,000 tons showed 1.56 kwhr per ton.

• **Eliminating Waiting Time**—The big problem in Colmol operation, as the accompanying table shows, was waiting on intermediate transportation. Average Colmol operating time at the face was 2 hr 17½ min per shift. Average time for portal-to-portal and lunch was 2½ hr. Average time lost for causes other than waiting for intermediate transportation was 1 hr 2½ min. The average time lost waiting for intermediate transportation was 2 hr 10 min per shift. It will be noted that this latter figure almost equals the Colmol operating time of 2 hr 17½ min. Since portal-to-portal and lunch times are fixed, it is this waiting for intermediate transportation that is the weak link in the Colmol continuous-mining chain.

• **How the New Transportation Unit Operates**—The Molveyor is self-propelled and may be 300 ft long—perhaps more. When mining coal, the unit is attached to the Colmol. It incorporates a novel steering mechanism that causes each succeeding section to follow the exact path of the preceding section either forward or in reverse. Thus, the Molveyor may "snake" around room necks—even 90-deg turns—while the Colmol is advancing, removing all the coal the machine produces every foot and every minute of the way. Then, it may be disconnected and will tram out to a position alongside of and parallel to the mother conveyor as though it were on tracks—and without hitting the ribs or corners.

Although the Molveyor is made up of individual sections, each with its own tramming and belt motor, the sections always are connected in a train. Sections are not added on the advance or taken out on the retreat. As soon as the mother conveyor is extended, the Colmol starts to mine near the receiving end and the Molveyor starts to advance or retreat in a parallel line. The receiving end of the Molveyor receives the coal without spillage, carries it in a steady stream—up to 4 tons per minute—and discharges it to the mother conveyor also without spillage. This permits mining a distance equal to the length of the Molveyor—say 300 ft—in any direction—right, left or straight ahead from the receiving end of the mother conveyor.

• **Design and Specifications**—The specifications for the Molvéyor are as follows:

| | |
|---|---|
| Weight, receiving or loading end, lb | 3,600 |
| Intermediate conveyor section | 3,100 |
| Discharge end | 5,000 |
| Height, loading end, in | 30 |
| Intermediate conveyor section | 30 |
| Discharge end | 31 |
| Width, receiving end (at hopper), in | 54¾ |
| Intermediate conveyor section | 51 |
| Discharge end | 51 |
| Length, loading end (hopper to pivot), ft-in | 17–7 |
| Intermediate conveyor section (pivot to pivot) | 15–0 |
| Discharge end (pivot to end of belt) | 20–10 |
| Tramming speed, fpm | 33 |
| Belt width, in | 24 |
| Belt speed, max., fpm | 400 |
| On present machine | 307 |
| Maximum capacity, tons per min | 4 |
| Tire size, all units, 6-ply | 4.00x8 |
| Motors, belt, loading end, hp | 2 |
| Traction, intermediate conveyor section | ½ |
| Belt | 2 |
| Discharge end, belt | 2 |
| Swinging boom | 1 |
| Hydraulic pump | 1 |

• **Electrical Controls, Loading End**—A headlight switch to serve as a tram signal is installed on the left-hand side in the operator's pit. There also is an emergency stop switch and a tram button for moving the unit toward the Colmol when the selector switch is in "Manual" position. A remote-control box is provided on a cable long enough to permit use either in the operator's pit or on the Colmol for tramming or loading, respectively, with a selector switch that can be set in either "Manual" or "Automatic" positions.

A signal-button-operated bell is provided for signalling the operator at the discharge end. When the selector switch is in "Manual" position, the Molveyor can be advanced toward the Colmol by button in the operator's pit. In "Automatic" position, a limit switch is actuated to hitch the Molveyor toward the Colmol in 6-in steps in accord with Colmol travel. An emergency stop switch is provided on the right side.

• **Electrical Controls, Discharge End**—Controls on the discharge end are as follows: emergency stop switches, both sides; tramming-light switch, right side only; tram buttons, both sides; signal button, both sides; start-and-stop buttons for belts, both sides; start-and-stop button for hydraulic pump, left side only.

• **Hydraulics, Loading End**—A hand-operated pump and cylinder is provided for raising the wheels off the floor, thereby setting the front end of the unit on the bottom for loading. These wheels are raised when tramming.

• **Hydraulics, Discharge End**—A motor-operated pump and valves are provided for the following functions, with control levers on both sides:

1. Steering.
2. Swinging conveyor boom up to 45 deg in either direction.
3. Raising and lowering main section of boom.
4. Raising and lowering extension section of boom.

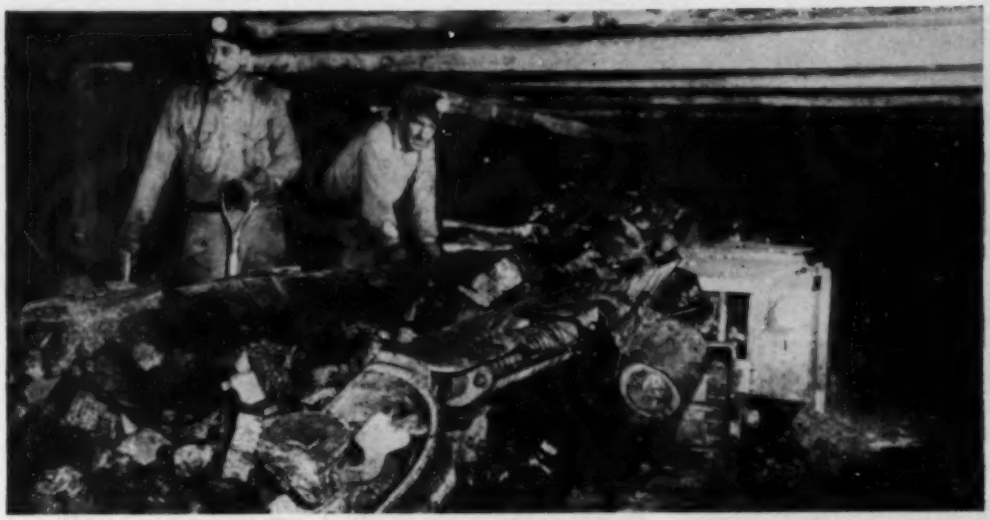
## How Red Jacket Successfully Uses Deep-Mine Haulage in Hilltop Areas

CUTTING IN WET PLACE with new rubber-tired universal machine. Breaks in the mountain make Coalburg a wet mine.

SEAM AND ROOF include (left) 5 ft of coal, 30 in of slate and sandstone broken by previous mining. Men are P. M. Farquharson (left), safety inspector, and N. W. Long, resident engineer. Center is 4 ft of shale under the sandstone with a 1-in coal parting 18 in up. Right is sandstone down to the coal. The portal accommodates men and the battery tractor handling materials.

HOLES ARE PUNCHED OUT at intervals as underground mining progresses for ventilation and man-and-material portals.

BATTERY-POWERED tractor and trailer delivering crossbars from one of the portals to a nearby section.



LOW-HEIGHT TRACTOR-TREAD LOADERS handle the production job. With a height of 31 in. capacity of the units is 10 tons per minute.

**Modern Machines and Methods Assure . . .**

# Efficient Trackless Mining

**Problem:** Hilltop Coal Areas and Adverse Top

**Development:** Belt Conveyors and Trucks to Tipple

**Production:** Crawler Loaders and Shuttle Cars

By J. H. EDWARDS

Associate Editor, Coal Age

UNDERGROUND HAULAGE with main and section belts rather than conventional contour mining and truck haulage around the outcrop was chosen by the Red Jacket Coal Corp. for its new 1,800-ton operation in a hilltop area of the Coalburg seam and delivering to the Mitchell Branch preparation plant.

Use of modern equipment and a carefully planned layout has made the mine the company's most efficient operation in spite of bad and variable top, an overburden broken by earlier mining of underlying seams, with consequent influx of water, and soft bottom. Three new-type high-capacity tractor-tread loading machines and a new-type rubber-tired cutter are employed for production. Holes are punched out at the crop line at intervals to provide man and material portals close to the sections where the three units are working.

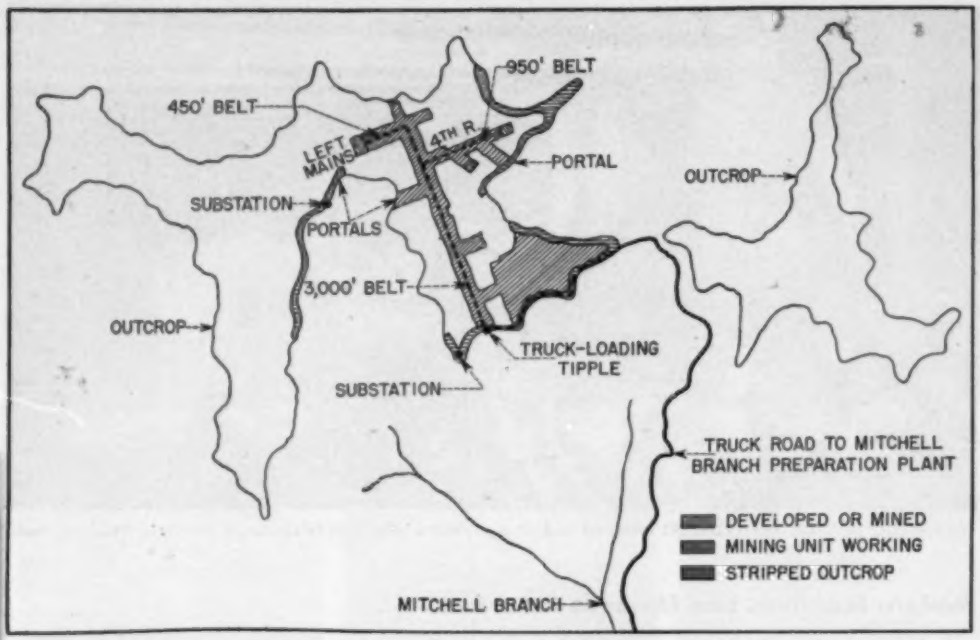
The Red Jacket Coal Corp., which produced 2,826,081 tons in 1950 from five operations in West Virginia and one in Virginia, is headed by Paul D. Ritter, Columbus, Ohio, and managed by William M. Ritter of Huntington and Red Jacket, W. Va.

• **Preparation Facilities Rebuilt**—Mitchell Branch, close to the operating headquarters at Red Jacket, is the oldest operation of the company. Its original tipple was built in 1902 to mine the Upper Cedar Grove seam, which outcrops 160 ft above the railroad track. The original mine-car dump hopper at that elevation now serves the dump trucks which haul down the mountain from the new Coalburg-seam operation above it.

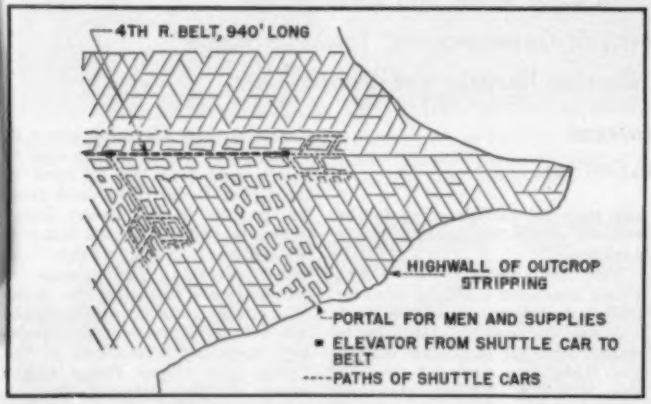
The plant was rebuilt in 1944 to handle coal from No. 32 mine in the Upper Cedar Grove and from No. 5 mine in the Lower Cedar Grove, in addition to the Mitchell Branch coal. A jig washer was added, screening and mixing facilities were installed to make nine grades, capacity was raised to 400 tph and five loading tracks were provided. Elevations of the Lower and Upper Cedar Grove seams at the Mitchell Branch plant are 1,083 and 1,166 ft respectively, while the elevation of the new mine in the Coalburg seam is 1,819 ft.

• **Stripping Starts Coalburg Development**—Mitchell Branch mine in the Upper Cedar Grove seam worked out in 1948, and to replace its tonnage stripping of the Coalburg outcrop was started in 1947. This stripping was stopped in 1948 after 2 mi of outcrop had been worked. Along that 2 mi, the

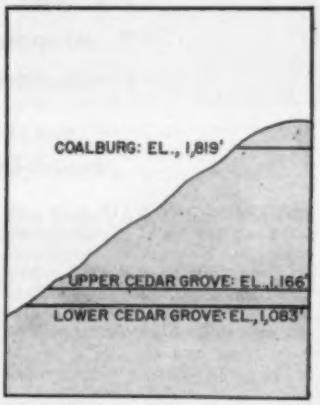
## Belt Conveyors Service Trackless-Mining Equipment at Coalburg




COALBURG MINE LAYOUT and development with belt conveyors. The coal is divided into two hilltop areas, part of which had been previously stripped. The coal is trucked to the Mitchell Branch preparation plant, previously re-equipped for added preparation efficiency. The newly developed operation produces 1,800 tpd.


4TH R. BELT, 940' LONG
HIGHWALL OF OUTCROP STRIPPING
PORTAL FOR MEN AND SUPPLIES
ELEVATOR FROM SHUTTLE CAR TO BELT
PATHS OF SHUTTLE CARS

STANDARD WORKING PLAN, with all places turned 60 deg, is shown in this 4th Right section, where two of the three loaders are working.




COALBURG OVERBURDEN was broken by earlier work in the Cedar Groves below.

immediate top was shale or drawslate which could be sidewall drilled. Sandstone top along other sections of the outcrop precluded further stripping. To replace the strip tonnage, a truck-loading tipple was built for underground mining in 1948.

The Coalburg acreage is approximately 600 and is in two principle areas, the outcrops of which are separated only 600 ft at a mountaintop gap that figured in the Hatfield-McCoy feud of 1882-1898.

With mining in the underlying seams having broken the mountain to the top in a number of places, it was decided that any pillaring in the Coalburg would be unsafe. Room mining is projected to recover approximately 66% of the coal.

Seam thickness as mined to date ranges from 40 to 76 in and has averaged 60 in. The bed has two thin partings which are removed in the cleaning process at the Mitchell Branch preparation plant. One parting, near the bot-

SOFT BOTTOM makes it tough for the cable-reel shuttle cars. The worst places are planked with wood.

SHUTTLE-CAR OPERATOR waits a few seconds until belt is free of inby load, whereupon automatic device starts the elevator.

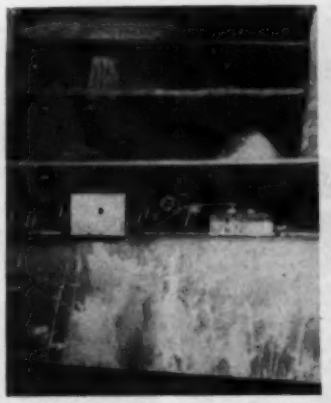
tom and continuous, is ½ to 1 in, and the other, consisting of ½ to 4 in of laminated coal, not continuous, is near the top. The coal is high-volatile with around 6% inherent ash and less than 1% sulphur, and is sold principally in the domestic and industrial markets.

The bottom is generally a soft gray shale which shuttle cars cut up when wet. The immediate top ranges from sandstone directly on the coal to shale ranging up to 13 ft in thickness. Where the shale is more than 3 ft thick it usually is strong. Under 3 ft, however, it usually is weak. There is generally a 1-in vein of coal in the shale top 18 in above the main bed, constituting a parting which makes it necessary to support the lower 18 in with crossbar timbering.

• **Trackless Mining Employed**—The entire larger tract is being mined from one portal and main belt set up. All belt conveyors are Goodman 30-in units equipped with greasing-type idlers. At present, the main-line conveyor is 3,000 ft long, a section conveyor on 4th Right is 950 ft, and another on the Left Mains is 450 ft.

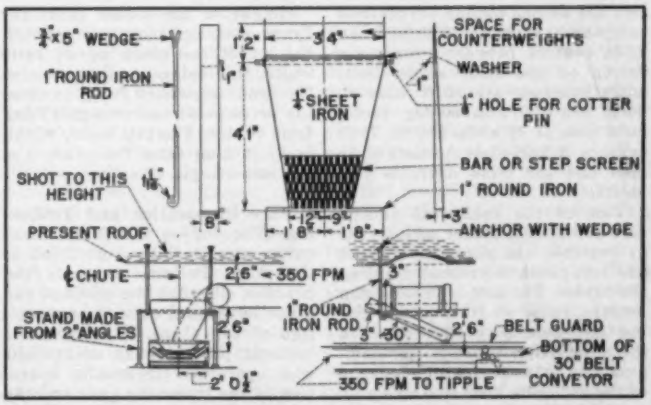
Mining equipment consists of three Goodman Type 660 tractor-tread loaders, six Joy 6SC shuttle cars (4-wheel drive and 4-wheel steer), three Joy elevators, one Jeffrey 7OUR rubber-tired cutter, two Jeffrey 35L shortwall cutters, two Joy T-2-6 crawler trucks for carrying the shortwalls, three CP 472 high-speed coal drills, and one Baker TJCX battery-powered rubber-tired tractor with trailer.

Rooms 20 ft wide on 36-ft cen-



LOADED BELT SAGS on roller-skate wheels, thereby holding down button to lock out nearby elevator until belt is empty.

CENTRIFUGAL SWITCH on lower run of main-line belt forms electrical interlock to stop section belts when main belt stops.




COUNTERBALANCED DISCHARGE CHUTE at belt transfer includes screen to bed fines on the belt under the lumps.

## Truck Haulage Employed for Final Transportation to Plant

COUNTERBALANCED CHUTE with screen lip changes coal direction, beds, fines under lumps and raises to let inby coal pass.

FULL HOPPER at truck-loading tipple presses against wing (arrow), operating indicator and stopping all underground conveyors.

PLASTIC SUCTION LINES to one of the eight 50-gpm gathering pumps used in dewatering Coalburg mine workings.

TRUCK-LOADING TIPPLE—building under conveyor gallery is barn and charging station for battery materials tractor.

MITCHELL BRANCH preparation plant. Trucks hauling from new Coalburg mine dump at headhouse top left.

ters are turned 60 deg off the belt entry and crosscuts 20 ft wide on 72-ft centers between rooms are driven on the same angle. Belt-entry headings are 16 ft wide on 50-ft centers, and 60-deg crosscuts, also 16 ft wide, are on 75-ft centers. A unit crew consists of 15 men and the mine operates two shifts.

Two of the cable-reel shuttle cars serve each loader and, as far as possible, the cars travel right and left paths to prevent tangling the cables. The new-type Goodman loaders, rated at 10 tpm, are giving particularly good service in the mine. High capacity, compactness and maneuverability because of the swinging head and swinging rear boom are points mentioned by the mine officials.

Height of the loader is 31 in. From a straight central position the loader can clean up an 18-ft width, this being possible because the head extends 10 ft 9½ in from the pivot point and swings 40 deg from center. The tail boom, which is 10 ft long from the pivot, has the same angle of swing.

• **Face Preparation and Timbering**—The Jeffrey 7OUR universal cutter also is doing a good job in the mine. Bottom-cutting is the practice although the machine can make horizontal cuts at any position or can shear. Full hydraulic controls provide easy adjustment and operation. Hydraulic operation of the tramming gear and the cable reel make for simplicity, compactness and low maintenance. One 50-hp motor drives the cutter chain and one 25-hp motor the two hydraulic pumps which power all other motions, including two-speed tramming and steering.

The drilling pattern is four holes in both rooms and headings and the shooting is done with du Pont Lump Coal C.

Because of the very weak roof under the thin rider seam, the wide variation in roof character, and the broken overburden, every heading and room is supported by 6x8-in by 16-ft wood collars on centers of 3½ ft or less. The timbers are set by hand, though, in some instances, the universal cutter is used as a hoist. Roof bolts have not been tried because the wide variation in roof character and strength would make it diffi-

STEEL SKIDS form bases for equipment and sills for the buildings to make substation semi-portable. The 200-kw m-g set is in the building at the right and the control panels are in the other.

cult to standardize on bolt length, method of drilling, etc.

Eight 50-gpm Deming Oilrite pumps are used in the mine and the suction and discharge lines are 2-in Carlon E and Johnsonite plastic pipe.

• **Belts Move the Coal**—Belt conveyors are Type 97HC Goodman operating at 350 fpm. The 3,000-ft main belt is driven by a 60-hp AC motor with fluid drive. Section conveyors are driven by DC motors. No belts are reversed, which spells simplified control and fewer difficulties in making belts train properly. Instead of using belts for carrying men and materials, the men walk in from the nearest portal and the mine timber and other materials are brought in by battery tractor and trailer.

Interlocking of controls and protection against operation of a section belt when the main belt has stopped or slowed down appreciably is afforded by Ensign centrifugal switches operated directly by roller contact on the main belt and located close to the section-belt discharge points.

On the 4th Right section belt, to prevent the outby elevator discharging onto the belt when it is already loaded, an interlock devised by C. H. Price, chief electrical engineer, and utilizing half of a roller skate, is installed under the center of the loaded side of the section belt at a point some 20 ft inby the elevator discharge.

The belt, deflected by the load, contacts the roller-skate wheels, thereby forcing down a spring-supported lever and holding down a push button. The desired delay in starting and stopping the elevator is controlled by positioning the roller-skate device a certain distance inby the elevator.

Transfer chutes designed by N. W. Long, resident engineer, bed the fines under the lumps, turn the coal in the right direction, and lower it to within a few inches of the belt, yet swing up automatically to allow passage of coal from inby. Wear and damage to the renewable section of screen in the lip of the chute attests to the severe punishment a belt would suffer if lumps fell directly onto it.

• **Power Equipment Includes Semi-Portable Substation**—Power at 250 volts DC for underground equipment is furnished by two manually started substations using rotary equipment and located at the crop line. One consisting of a 200-kw Westinghouse motor-generator, is semi-portable. The rotating unit is in one steel building and the control panels in another. These equipments are on steel skids which also serve as sills for the buildings. The units, complete with the buildings, can be moved by dragging with a bulldozer.

A third unit in this semi-portable substation is a General Electric Pyranol auto-transformer which reduces line voltage from 4,160 to 2,300 to supply the motor-generator. This auto-transformer is mounted outdoors back of the buildings on a small platform surrounded by a wire fence.

A short belt conveyor elevating from the discharge of the main underground belt to the tipple hopper was made in the coal company's shop. It is driven by a General Electric 20-hp motor through a Falk gear. A Bindicator on a wing board at the discharge of the elevating conveyor stops the mainline belt when the tipple hopper is full.

A barn and charging station for the Baker Type TJCX tractor is located under the tipple. The tractor is equipped with two sets of Philco batteries. Duty on the tractor is severe because of the soft bottom, although the worst places are paved with wood.

• **Safe Operation Achieved**—In spite of the weak, variable and broken top, the mine has made a good safety record. Data from the files of J. J. Plasky, training and safety director, and P. M. Farquharson, chief safety inspector, show a frequency rate of 29.37 for 1950 for Mitchell Branch mine, which includes the Coalburg operation. In the last three years, Mitchell Branch has had only five lost-time accidents from falls of roof. During that period, 1,878,497 tons was mined. In 1946, there were, in contrast, in that one year, 17 lost-time accidents from falls of roof in Mitchell Branch mine.

Trucking the coal 2½ mi down a rocked road from the Coalburg portal to the preparation plant is handled by 16-ton White gasoline trucks. Maximum grade is 10% and all grades are in favor of the loads.

• **Production Forecast**—Tonnage to come out of the Coalburg in 1951 has been forecast at 339,300, based on 15 days per month and 180 days per year. Engineers and operating officials prepare each year, in considerable detail, a plan of working and tonnage forecast for each mine. This shows where each mechanical unit is scheduled to work each month to maintain development and tonnage.

Among other officials concerned with the Coalburg mine and not already mentioned are: R. A. Ison, assistant general manager; A. F. Cook, general superintendent of the Red Jacket Div.; E. S. Ferrell, superintendent of Mitchell Branch mine; Tony Webb, general mine foreman, day shift; E. S. Burleson, general mine foreman, night shift; Dorsel Steele, general assistant foreman, day shift, Coalburg; John Tiller, general assistant foreman, night shift, Coalburg; John F. Maurice, chief engineer; C. H. Williams, assistant chief engineer; and C. P. Ferguson, preparation manager.

## The 1951 Coal Show . . .

# Opportunity for Coal Men

L. C. CAMPBELL
Chairman, Coal Division

AT THIS CRITICAL TIME in our Nation's history, the coal-mining industry not only faces heavier responsibilities as the country's major source of fuel and energy, but also has before it even-broader opportunities for progress through service. If it is to discharge its responsibilities to the fullest, and take maximum advantage of the opportunities that lie ahead, the industry needs the facts and ideas on which to build.

Past conventions and expositions of the American Mining Congress, as coal men well know, have been prime sources of facts and ideas of immeasurable benefit to the industry. The 1951 convention and exposition surpasses all others in this respect. The technical sessions feature more than ever authoritative discussion of ways to achieve safer and more-efficient mining and preparation, build employee and public goodwill and broaden the markets for coal. The equipment display is unparalled in Coal Show history—and in the opportunities it suggests for cutting cost, heightening quality and promoting safety.

I sincerely feel, therefore, that the 1951 Coal Show is one no man should miss. I urge you to come to Cleveland, attend the technical sessions, study the exhibits and exchange ideas with your fellow mining men. You, your company, your industry and your country will benefit.

C. J. POTTER
Chairman, Program Committee

COAL MEN TODAY are challenged not only by routine operating problems but also by the difficulties imposed on the economy of the country by the defense effort. For example, manpower, equipment and materials shortages in the immediate future may exceed in severity even those experienced in World War II, thus putting a premium on efficiency in production, preparation and safety, requiring an even-better understanding of the problems involved in coal marketing and in relations with employees, the government and the public.

The answer is greater skill in mining, preparing and merchandising coal, and in building employee and public goodwill. The members of the program committee have done an outstanding job of reaching this goal, and it is easy, therefore, to commend the results to all mining men interested in new ideas for fueling the defense effort and preparing the industry for a better future.

The program will cover all phases of deep and strip mining, with emphasis on new machines and new methods, and will be rounded out with authoritative studies of the role of coal in the national defense, employee and public relations, safety, and problems and progress in coal utilization. Plan now to reserve time for the technical sessions. The benefits will make it time well spent.

J. T. RYAN JR.
Chairman, Manufacturers' Division

MORE THAN 225 of the Nation's leading manufacturers of mining equipment and materials are cooperating in staging the 1951 Coal Show—the largest in the history of the industry. Their aim is double-barreled—to show all the latest developments in their products, and to talk over with you any problems you may have. Here, in four days' time and in one central location, you can study the latest in mining equipment and materials, check and double-check their application to your job, and take home a wealth of data and ideas for promoting safety and efficiency in mining and preparation.

Everything from the largest coal stripper to the smallest supply item will be featured at Cleveland, including continuous miners, loading machines, shuttle cars, cutters, drills, locomotives, conveyors, mine cars, timber setters, pump-fans, electrical equipment, engines, preparation and safety equipment, shop and maintenance equipment, and all types of stripping equipment and materials.

I can vouch for the fact that the mining manufacturers look on the 1951 Coal Show as a new opportunity for contributing to the industry's progress through higher efficiency, better preparation and greater safety. Come and see us at Cleveland and bring your problems with you. We will welcome the opportunity of helping you solve them.

## The 1951 Coal Show . . .

# What the Program Offers

### MONDAY AFTERNOON, MAY 14

#### National Defense—Public Relations

**Coal and National Defense**—Speaker to be announced.

**Public Relations in the Anthracite Industry**—F. W. Earnest Jr., Anthracite Institute.

**Public Relations in Bituminous Fields—Company Magazines and TV Broadcasts**—George van Hagan, Peabody Coal Co.

**Mining-Community Activities**—J. E. Elkin, Duquesne Light Co.

### TUESDAY MORNING, MAY 15

#### Coal Preparation

**Wet-Cleaning Fine Coal**—Byron M. Bird, Jeffrey Mfg. Co.

**Current Practices in Air-Cleaning**—W. C. McCulloch, Roberts & Schaefer Co.

**Recent Development in Coarse-Coal Cleaning**—David R. Mitchell, Pennsylvania State College.

**Cleaning Small Sizes of Anthracite**—James Hannigan, Glen Alden Coal Co.

**Related Problems of Mechanical Coal-Cleaning**—F. P. Calhoun, Rochester & Pittsburgh Coal Co.

#### Maintenance and Power

**Planning for Preventive Maintenance**—W. E. Wolfe, National Electric Coil Co.

**Underground Maintenance Organization**—Wm. MacGregor, Bell & Zoller Coal & Mining Co.

**Lubrication of Mining Equipment**—V. O. Murray, Union Pacific Coal Co.

**Automatic Centralized Lubrication**—L. W. Deutsch, Trabon Engineering Corp., and J. B. Anderson, The Texas Co.

**AC and DC Operation Compared**—J. Z. Linsenmeyer and A. G. Owen, Westinghouse Electric Corp.

### TUESDAY AFTERNOON, MAY 15

#### Roof Support

**Roof-Bolting With Large Mobile Equipment**—John K. Berry, Consolidation Coal Co. (Ky.), Div. Pittsburgh Consolidation Coal Co.

**Roof-Bolting in Thin Seams With Portable Equipment**—C. E. Hough, Imperial Smokeless Coal Co.

**Geological Considerations in Roof-Bolting**—Paul H. Price and A. T. Cross, W. Va. Geological Survey.

**Roof-Bolting With Dust-Control Equipment**—James Westfield, U. S. Bureau of Mines.

**Combined Coal Drill and Timber-Setting Machine**—Clarence M. Haya, Pittsburgh Coal Co., Div. Pittsburgh Consolidation Coal Co.

#### Strip Mining

**Compressed-Air Vertical Drilling**—W. J. Crawford, Enos Coal Mining Co.

**Selective-Elevation Horizontal Drilling**—Donald B. Saxton, Hanna Coal Co., Div. Pittsburgh Consolidation Coal Co.

**Other Late Developments in Overburden Drilling**—Gene H. Utterback, United Electric Coal Cos.

**Drilling and Blasting in Two-Seam Stripping**—Russell Badgett Jr., Badgett Mine Stripping Corp.

### WEDNESDAY MORNING, MAY 16

#### Mechanical Mining

**Mechanical Loading With Extensible Conveyors**—A. B. Crichton Jr., Johnstown Coal & Coke Co.

**Trackless Mining in 30-In Coal**—Irvin C. Spotte, Princess Elkhorn Coal Co.

**Main-Entry Development in Low Coal**—W. D. Hawley, Eastern Gas & Fuel Associates.

**Mechanical Mining in Anthracite**—E. F. Young, Philadelphia & Reading Coal & Iron Co., and W. I. Stonebraker, The Hudson Coal Co.

#### Safety

**Protection Against Electrical Hazards in Coal Mining**—George C. Barnes, Virginia Polytechnic Institute.

**Pulmonary Diseases as Related to Coal Mining**—Dr. A. J. Vorwald, Trudeau Foundation.

**Advances in Illumination for Coal Mines**—G. F. Prideaux and C. M. Crysler, General Electric Co.

**Permissibility of Diesel Locomotives for Coal Mining**—J. H. East Jr., U. S. Bureau of Mines.

### WEDNESDAY AFTERNOON, MAY 16

#### Continuous Mining

**Symposium Covering Machines and Operating Methods**—Gerald von Stroh, Bituminous Coal Research, Inc.; A. Lee Barrett, Joy Mfg. Co.; M. F. Cunningham, Goodman Mfg. Co.; E. M. Arentzen, Lee-Norse Co.; and W. J. Phillips, Sunnyhill Coal Co.

**Coordinating the Auxiliary Operations**—T. L. Aitken, Ebensburg Coal Co., and H. B. Wickey, Pennsylvania Coal & Coke Corp.

**Slope-Driving With a Continuous Machine**—H. A. Treadwell, Chicago, Wilmington & Franklin Coal Co.

#### Strip Mining

**Large Augers for Highwall Mining**—Charles Compton, Grafton Coal Co., and D. M. Bondurant, School of Mines, West Virginia University.

**Torque Converters in Strip-Mine Haulage Units**—R. M. Schaeffer, General Motors Corp.

**Stripped-Land Use Developments**—Coal and Other Mining Industries.

### THURSDAY MORNING, MAY 17

#### Coal Utilization

**Problems of Industrial Mobilization**—Speaker to be announced.

**Research for Future Uses of Coal**—Dr. A. A. Potter, Bituminous Coal Research, Inc.

**New Developments in Coal-Burning Locomotives**—George D. Creelman, M. A. Hanna Co.

**Cyclone Furnace for High Combustion Efficiency**—Merle Newkirk, Dow Chemical Co.

### SPECIAL EVENTS

**Manufacturers' Div. Meeting**—Including Discussion of Materials-Procurement Problems, Tuesday pm.

**Purchasing Agents' Round Table, Wednesday am.**

**The Fred Waring Show, Wednesday evening.**

The 1951 Coal Show . . .

# What's What in Equipment

## Here's the Lineup of the Exhibits You'll See at the 1951 Coal Show—the Largest Exposition of Mining Machinery, Equipment and Supplies Ever Under One Roof

**This Section Is Prepared for Your Use Before You Go to Cleveland. Exhibits Are Classified by Product and New Items Are Highlighted. Check It Now to Save Time and Footwork Later and to Make Sure You'll See the Equipment of Special Interest**

### Stripping

**Aero Service Corp.** — Photo-reconnaissance and topographic mapping.

**Bucyrus-Erie Co.** — Power shovels and draglines from ⅝ to 36 cu yd; blasthole drills.

**Atlas Powder Co.**—Atlas blasting methods; Rockmaster split-second delay system.

NEW — Atlas adjustable blasting galvanometer and fluted-end cartridge for easy loading.

**Austin Powder Co.**—NEW plastic-coated water-resistant all-purpose fuse; 6- and 9-in. tungsten-carbide drill heads.

**Baldwin - Lima - Hamilton Corp., Lima-Hamilton Div.** — Lima shovels and draglines for open-pit work.

**Cardox Corp.** — Augers, molefoot and tungsten - carbide - tipped drill heads, bits, thread bars and boxing.

NEW—Two 20- to 40-in augers for surface mining.

**Chicago Pneumatic Tool Co.**—CP air drills.

**E. I. du Pont de Nemours & Co., Inc.**—Nitramon and du Pont Red Cross Extra explosives and du Pont Primacord.

**Electric Steel Foundry Co.**—ESCO dragline buckets and shovel dippers featuring ESCO box-type points and adapters; ESCO manganese - steel dragline-bucket fittings, manganese-steel dozer blades, and alloy-steel blades and bits.

**Euclid Road Machinery Co.**—Twin-engine scraper with 190-hp engines front and rear.

**Fulton Bag & Cotton Mills** — F.F.F.F. tamping bags.

**Harnischfeger Corp.** — Stripping shovels and draglines.

**Hendrix Mfg. Co., Inc.**—Latest-model Hendrix draglines buckets.

**Hercules Powder Co.**—Strip-mining explosives.

**Joy Mfg. Co.**—NEW Joy Champion blasthole drill, and new diesel-driven auger drill for highwall recovery, plus carbide-tipped drilling equipment.

**Kennametal, Inc.** — Kennametal drilling tools.

**LeRoi Co.**, Cleveland Rock Drill Div. —Rock drills.

**Marion Power Shovel Co.** — Coal-stripping and loading machines, including the Marion 7400 walking dragline.

**Mobile Drilling, Inc.**—Mobile drills for mining applications.

NEW—B-35 drill mounted on and powered by four-wheel-drive vehicle and capable of drilling horizontal or vertical holes either wet or dry; also new midget P-40 drill powered by 3-hp engine, handling like lawn mower, weighing less than 300 lb and drilling 2½-in holes.

**Northwest Engineering Co.**—Northwest shovels and draglines.

**Osgood Co. and General Excavator Co.**—¾- to 2½-yd shovels and other excavating equipment, including rubber-tired clamshells.

**Page Engineering Co.**—Page automatic buckets.

**Western Cartridge Co., Div. Olin Industries Inc.** — Western Blasting caps, and Columbia Powder and Equitable Powder explosives.

### Tractors and Tractor-Loaders

**Allis-Chalmers Mfg. Co., Tractor Div.**—NEW complete line of crawler tractors, including giant HD-20G fitted with 4-yd front-end shovel. Baker, Tractomotive and Gar Wood join in the exhibit by fitting the machines with their latest mounted and drawn equipment for stripping and materials - handling. Allis-Chalmers also will exhibit the Model R road-maintenance unit with utility rear-end loader.

**Caterpillar Tractor Co.** — Complete array of Caterpillar machinery, including D7 diesel tractor equipped with Traxcavator, D9 tractor fitted with 8U bulldozer and Hyster D8L towing winch, D7N towing winch, DW20 tractor with Athey PD20Q side-dump wagon, and DW21 tractor and scraper.

**Frank G. Hough Co.**—Hough Payloaders, including 1½-yd HM, 1¼-yd HY and high-lift HFH.

**International Harvester Co., Industrial Power Div.**—TD-24 crawler tractor and blade, TD-9 tractor with overhead loader ,and TD-24 electrically powered crawler (in miniature).

**R. G. LeTourneau, Inc.**—Super C Tournadozer with bulldozer blade.

### Trucks and Engines

**American Air Filter Co., Inc.**—Cycoil oil-bath air cleaner and CMS multiduty automatic self-cleaning air filter.

**American Steel Foundries**—ASF 36-in safety fifth wheel tractor-trailer coupler and ASF-Linco "Level-Load" trailer axle.

**Buda Co.**—NEW, three DA Dyna-Swirl diesel engines: 6-DAS-844 supercharged, 6-cylinder, 280-hp.; 8-DAS-1125 supercharged, 8-cylinder, 350-hp; 6-DA-844, 6-cylinder, 215-hp.

**Calcium Chloride Association**—Calcium-chloride base and surface stabilization for haulage roads.

**Caterpillar Tractor Co.**—No. 12 diesel motor grader, D397 industrial engine, D337 and D397 diesel engines.

**Cummins Engine Co., Inc.**—Three Cummins diesel engines of the lightweight high-speed high-horsepower Cummins line: 150-hp JS-600, 300-hp NHRS-600, and 550-hp NVHS-1200.

**Dart Truck Co.**—Dart strip-haulage equipment.

**General Motors Corp., Detroit Diesel Engine Div.**—Series 71 3-cylinder engine, 100 hp at 2,000 rpm; Series 71 6-cylinder engine, 200 hp, equipped with GM torque converter; Model 6-110 6-cylinder engine in the 250-275-hp class; and the GM torque converter.

**Euclid Road Machinery Co.**—25-ton bottom-dump coal hauler and 22-ton Model TD rear-dump truck.

**Hercules Motors Corp.**—Hercules 4-cycle lightweight high-speed diesel engine; gasoline and diesel power units; diesel replacement engines for light trucks.

**International Harvester Co., Motor Truck Div.** — Model LF-212 161-in-wheelbase 6-wheel chassis and cab truck; Model LFD-305 diesel-powered 145-in wheelbase chassis and cab truck.

**R. G. LeTourneau, Inc.**—Model C Tournamatic Tournarocker with torque converter — a shovel-, clam-

shell- or dragline-loaded 18-ton rocker-dump haulage unit.

**Mack Mfg. Co.**—Model LVT tractor teamed with Heil 50-yd center-dump trailer and equipped with Planidrive rear axle, 8-speed Duplex transmission and 300-hp NHRBS Cummins diesel; Mack Model LRSW six-wheel chassis with similar power, Mack "Balanced Bogie," Schneider torque converter and 4-speed Mack transmission.

**Murphy Diesel Co.**—Murphy diesel engines and generator sets.

**Sterling Motors Corp.**—Heavy-duty 161-in-wheelbase dump truck with 175-hp diesel engine and 10-cu yd body.

**Twin Disc Clutch Co.**—Twin Disc three-stage hydraulic torque converter, aluminum hydraulic couplings, Hydro-Sheave drives, friction clutches and hydraulic power takeoff.

## Mechanical Loading

**Cardox Corp.** — NEW auger drills 20 to 40 in in diameter for surface and underground mining, with the underground unit featuring permissible equipment.

**Clarkson Mfg. Co.**—Clarkson 28FA "Redbird" loader mounted on dual tires and with differential eliminated for increased traction.

**Goodman Mfg. Co.**—L-20 underneath shaker drive featuring low height, small overall dimensions and high capacity, with built-in motor and column-type pan line; E-11 shaker drive, Size O pan line.

NEW—860 low-type and 665 standard-height tractor-tread loaders, both featuring swinging loading head and discharge, new safety features and two-speed transmissions; swing-motion device for K-type duckbill for use while extending, retracting or in neutral position; lightweight "Duckling" for ready portability and loading in narrow gangways, etc.; and, probably, new-type mining-and-loading machine.

**Jeffrey Mfg. Co.**—Model A Colmol, 33 to 53 in, and Model B Colmol, 45½ to 72 in and up.

**Joy Mfg. Co.**—Joy continuous miners and loading machines.

NEW—20-BU-1 loading machine for high capacity in thin coal.

**Lee-Norse Co.**—NEW "Koalmaster" rubber-tired cutting and loading machine of the continuous type for high-coal seams, with a capacity of 2 tons per minute and using the "milling-cutter" principle.

**Myers-Whaley Co.**—Whaley Automat loading machines.

## Face Preparation

**Acme Machinery Co.**—NEW jumbo with long-feed drifter drills; new line of portable mine air compressors.

**American Cyanamid Co., Explosives Dept.**—Proper use of explosives in face preparation.

## Post-Convention Report

**AS A READER SERVICE, Coal Age, in its June issue, will present a complete report on the 1951 Coal Show, including digests of the papers and descriptions of the products displayed by manufacturers.**

**Armstrong Coalbreak Co.** — Air-breaking shells, compressors and auxiliaries.

**Austin Powder Co.**—Complete line of drilling tools, including tungsten-carbide cutting and drilling bits.

**Bowdil Co.** — Bowdil cutter bars, chains and bits.

**Carboloy Co., Inc.**,—Carboloy mining tools.

**Cardox Corp.**—Cardox and Airdox coal-breaking; complete line of Cardox drilling equipment, including augers, molefoot and carbide-tipped cutter heads, bits, thread bars and boxing.

**Chicago Pneumatic Tool Co.**—Tire-mounted Tramdrill; hand-held and post-mounted coal drills.

**Cincinnati Mine Machinery Co.**—Cincinnati cutter chains, bars, bits and sprockets.

**Crichton Co., Equipment Div.** — Crichton flexible-shaft drill operating from power takeoff on most mining machines.

**Deeley Bros.** — Post-mounted coal drills and a full line of augers and cutter heads.

NEW—Superior hydraulic drill.

**E. I. du Pont de Nemours & Co. Inc.**—Permissible explosives, iron-wire blasting caps, permissible blasting machines and du Pont "Detect-a-Meter."

**Firth Sterling Steel & Carbide Corp.**—Firthite mining tools, including "Blue Bits."

**Goodman Mfg. Co.**—Type 512FJH shortwall with hydraulic control and bugdusters; Type 121 bugduster for Type 12 shortwalls.

NEW — Type RHT.2 tractor-tread shortwall truck with cable reel and power takeoff.

**Hercules Powder Co.**—Hercules explosives for coal mining, delay detonators and 10-cap permissible blasting machine.

**Jeffrey Mfg. Co.**—70-URB rubber-tired universal cutter; 74BR all-hydraulically operated rubber-mounted drilling machine.

**Joy Mfg. Co.** — Joy cutters and drills; tungsten-carbide bits.

NEW — Combination drilling and timbering machine for difficult face-preparation areas.

**Kennametal, Inc.** — Kennametal tungsten-carbide bits for any cutting or drilling service.

**LeRoi Co., Cleveland Rock Drill Div.**—Rock drills for coal service.

**Precision Chain Co.**—Precision cutter chains for both Rockbuster-Multiplex and standard ½x1 bits, plus chain links, bits and other parts.

**Frank Prox Co., Inc.**—Prox Duomatic cutter chains for conventional and tungsten-carbide bits and Prox Tool-Steel throwaway bits; cutter bars for various machines; drive sprockets; tungsten-carbide mining tools.

**Tamping Bag Co.**—"Sealtite" tamping bags made from wet-strength paper.

**Bertrand P. Tracy Co.**—Tracy cutter bars and chains.

**Vascoloy-Ramet Corp.** — Cemented-carbide mining tools, including straight-shank, shoulder-type and continuous-miner-type cutter bits; hand-held and mounted auger drills.

**Western Cartridge Co., Div. Olin Industries, Inc.** — Complete Western Cartridge line of blasting caps; complete line of Columbia Powder and Equitable Powder explosives.

## Roof Control

**Baker-Raulang Co.** — Mine tractor and timbering machine.

NEW — Baker-Fletcher roof drill and wrench.

**Bethlehem Steel Co.** — NEW roof-bolt extensions.

**Carboloy Co., Inc.**—Carboloy roof-bolting drills.

**Chicago Pneumatic Tool Co.**—NEW mobile roof-bolting unit, combining drilling and nut-running.

**Duff-Norton Mfg. Co.** — Mine-timbering and roof jacks, pin-timbering and angle jacks.

**Elreco Corp.** — Elreco roof-bolting method.

**R. M. Hollingshead Corp.**, Cocoon Engineering Div.—Cocoon vinyl-plastic film for roof-sealing.

**Joy Mfg. Co.**—Hydraulic and air-driven roof-bolting drills; mobile and stationary compressors.

NEW — combination drilling and timbering machine for difficult face-preparation situations; two self-propelled roof-bolting drills; and three hydraulic impact wrenches.

**Kennametal, Inc.**—NEW HFD bit for rotary drilling of bolt holes.

**Lee-Norse Co.** — Model RJ4 "roof-

service jeep"—a rubber-tired machine for both roof-bolting and timber-setting.

**LeRoi Co., Cleveland Rock Drill Div.**—NEW permissible electric crawler-type stoper jumbo for roof-bolting, with dust collector for each stoper; also other roof-bolting stopers.

**Manco Mfg. Co.**—Guillotine portable hydraulic roof-bolter cutter, said to be able to trim 1-in bolts in 3 sec; weight, 32 lb.

**Mine Safety Appliance Co.**—M-S-A bolt-hole cleaner.

**Oliver Iron & Steel Corp.**—Oliver roof bolts.

**Osmose Wood Preserving Co. of America, Inc.**—Osmose timber treatment; Osmose wooden mine roof plugs.

**Pattin Mfg. Co.**—Roof bolts, including special types for low coal.

**Pittsburgh Screw & Bolt Co.**—"Pit-Bolts" for roof support in both the expansion and split-rod types.

**Schroeder Bros.**—All-hydraulic crawler-mounted roof-bolting machine, said to be capable of drilling 60-deg-angle holes and flexible enough for installing roof channels.

**Star Jack Co.**—NEW dual-foot hydraulic timber-setter and roof-bolt drilling jack.

**Templeton, Kenly & Co.**—Automatic ratchet lowering jacks for thin, medium and thick seams; ratchet and screw-operated roof and timber jacks; pin-up jacks; and specialized roof and timber jacks.

**Vascoloy-Ramet Corp.**—Roof drills.

**West Virginia Steel & Mfg. Co.**—Full line of wedge and expansion-type roof bolts, with washers, plates and roof ties.

## Mine Cars, Shuttle Cars, Locomotives and Track

**American Car & Foundry Co.**—NEW-design 4-ton drop-bottom car dumped by simple spring-mounted roller.

**American Mine Door Co.**—Canton track cleaner.

**American Steel Foundries**—American mine-car coupler.

**Bethlehem Steel Co.**—17-ton car with cast-steel truck, forged-steel wheels, cushion draft gear and automatic couplers; heavy-duty trackwork.

**Brown-Fayro Co.**—Brownie HGD car- and trip-spotting hoist.

**Cheatham Electric Switching Device Co.**—Electric track switch and derail for high-speed main-line haulage, including contactors and controllers.

**Coal Mine Equipment Sales Co.**—Rebuilt mine locomotives.

**Connellsville Mfg. & Mine Supply Co.**—Rotary dumpers, sheaves, skips, cages, hoists, haulage and related equipment.

**Differential Steel Car Co.**—Differential mine cars and locomotives.

**Enterprise Wheel & Mine Car Corp.**—Late mine-car design features.

**Flood City Brass & Electric Co.**—Room and car-spotting hoists.

**Goodman Mfg. Co.**—Type 580 elevating-discharge shuttle car.

**Jeffrey Mfg. Co.**—NEW shuttle car introducing new features in design and construction; 25-ton 8-wheel haulage locomotive.

**Joy Mfg. Co.**—NEW 8-SC shuttle car for low coal; two new methods of haulage behind continuous miners.

**Koppers Co., Inc.**—Pressure-treated ties.

**Nachod & U.S. Signal Co.**—Block signals and trolley contactors.
NEW—Automatic signal and portable and visible warning signal.

**National Malleable & Steel Castings Co.**—NC-1 truck for mine cars, Willison automatic couplers, Sharon 10 couplers, M-230 rubber-cushioned draft gear for rotary-dump cars, M-225 rubber-cushioned draft gear for locomotives and large non-rotary-dump cars, and swivel and link hitchings.

**National Mine Service Co.**—NEW 10-ton diesel locomotive for underground mine haulage.

**Nolan Co.**—Nolan Model NL5N Porta-Feeder for trip and car feeding.

**Ohio Brass Co.**—Form-8 and Form-9 automatic couplers.

**Rydin Ry. Equipment Co.**—Ryd-in automatic couplers in two sizes.

**Sanford-Day Iron Works**—NEW mine car.

**Sterling Steel Casting Co.**—Full line of Sterling cast-steel mine-car wheels equipped with Sterling permanent grease seals, bearing adjustment and locking device.

**Watt Car & Wheel Co.**—Big 8-wheeled mine car with automatic couplers, rubber draft gear and cast-steel wheels.

**Westinghouse Electric Corp.**—"Lo-Liner" locomotives.

**West Virginia Steel & Mfg. Co.**—Prefabricated track with switches equipped with special rerailers, standard mine ties, composite wood-steel ties, and light and heavy switch stands.
NEW—heavy cam-motion parallel-throw switch stand, redesigned manganese-steel frog, and self-contained hydraulic rail bender.

## Mine Conveyors and Belting

**Armstrong-Bray & Co.**—Belt splicers and fasteners.

**Barber-Greene Co.**—NEW Type 366 portable mine conveyor used in series for follow-up haulage behind continuous-mining machines; fitted with 24-in belt, 20 ft long, rubber-tired mounted, and weighing 1,600 lb.

**Flexible Steel Lacing Co.**—Flexco belt fasteners.

**Goodman Mfg. Co.**—Type 99-6-A5-36 heavy-duty belt conveyor.

**Hamilton Rubber Mfg. Co.**—Hamilton King Koal conveyor belt.

**Irwin Foundry & Mine Car Co.**—G-40 unit-construction self-lubricating reversible belt conveyor.

**Jeffrey Mfg. Co.**—NEW train of Molveyor rubber-tired sectional belts for serving continuous-mining machines.

**Joy Mfg. Co.**—Chain, shaker and belt conveyors.
NEW—two methods of haulage behind continuous miners.

**Link-Belt Co.**—L-B conveyors and conveyor idlers.

**Long Super Mine Car Co.**—NEW 400-R room conveyor and new Piggy-back continuous room-transportation system for mechanical loaders and continuous miners.

**National Mine Service Co.**—Hayden system of conveyor-belt fastening.

**Raybestos-Manhattan Co., Manhattan Rubber Div.**—Various types of coal-mine belting equipped with several types of fasteners.
NEW—Ray-Man belting.

**W. O. & M. W. Talcott, Inc.**—Talcott conveyor fasteners and Talcott Acme patch fasteners.

**United States Rubber Co., Mechanical-Goods Div.**—Conveyor belting and splicing with portable vulcanizer.

## Pumping and Drainage

**Allis-Chalmers Mfg. Co., General Machinery Div.**—"Electrifugal" and other pumps.

**American Car & Foundry Co.**—Lubricated plug-type valves for mine use.

**Armco Drainage and Metal Products, Inc.**—Pipe-Arch drainage pipe; corrugated and spiral-welded pipe; Hel-Cor pipe.

**Brown-Fayro Co.**—Latest-model Austin-Brownie mine gathering pump.

**Carlon Products Corp.**—Various grades of Carlon plastic pipe, including Carlon "E" flexible pipe and Carlon plastic pipe fittings.
NEW—rigid plastic material for borehole casing.

**Deming Co.**—Pumping equipment, including Fig. 1896 "Oil-Rite" double-acting mine pump and Fig. 3312 self-priming pump.

**Flood City Brass & Electric Co.**—Mine-pump line, including a 2½x3 plunger pump developed in the past year.

**Gorman-Rupp Co.**—Line of centrifugal pumps; self-priming pumps for strip-mine service.
NEW—2- and 3-in self-priming centrifugal pumps featuring lower-horsepower requirements.

**Johnson Plastic Corp.**—Johnsonite flexible plastic pipe.

**National Tube Co.**—Pipe and tubing.

**Victaulic Co. of America**—Complete line of Victaulic couplings, and full-flow elbows, tees, reducers and valves; also ratchet-type hand-operated Vic-groovers and the Vic-power groover.

## Ventilation

**American Brattice Cloth Corp.**—Mine-vent ventilating tubing and ABC jute brattice cloth.

NEW—ABC inflatable brattice.

**Benis Bro. Bag Co.**—Flexipipe ventilating tubing.

**Clarkson Mfg. Co.**—Clarkson double-swing door equipment for shuttle cars.

**John Flocker & Co.**—Dry-treated flame- and mildew-resistant jute brattice cloth.

NEW—Firestone plastic brattice sheeting.

**Fulton Bag & Cotton Mills**—Blaze Braker and F.F.F.F. brattice cloth.

**R. M. Hollingshead Corp., Cocoon Engineering Div.**—Cocoon vinyl plastic sealing for stoppings and overcasts.

**Jeffrey Mfg. Co.**—Type 12-A 6-ft Aerodyne fan; Aerodyne Midget tubing blower.

**Joy Mfg. Co.**—Joy mine fans and portable blowers.

**Mana-Mine Research & Development Co.**—Paste compound for air and water sealing of stoppings, brattices, mine doors and air shafts.

**Upson-Walton Co.**—Upson-Walton brattice cloth.

## Motors and Controls

**Albert & J. M. Anderson Mfg. Co.**—Pow-R-Gard and Ground-Gard entry-to-face power-distribution systems.

**Allis-Chalmers Mfg. Co., General Machinery Div.**—Motors, including tube-cooled and totally enclosed fan-cooled.

**Dooley Bros.**—NEW contactor.

**Electric Controller & Mfg. Co.**—"Tab-Weld" resistors for motor controllers; Valimitor starter for 2,300-4,600-v motors.

NEW—automatic reclosing sectionalizer and undervoltage protection circuit for AC motor starters.

**Ensign Electric & Mfg. Co.**—Ensign-Clark magnetic mine starters in open and explosion-tested enclosures for AC and DC; Ensign mine-power distribution boxes in dust-tight and permissible enclosures; Ensign centrifugal switches for belt conveyors; Ensigneer belt control; Ensign drill boxes with contactors.

**Goodman Mfg. Co.**—Camtactor controller and belt-conveyor roller switch.

**I-T-E Circuit Breaker Co.**—KSC automatic-reclosing circuit breaker, BT-4 industrial thermostat relay, and KB steel-enclosed circuit breaker.

**Joy Mfg. Co.**—NEW ground-fault detector of the core-balanced type, suited to all low-voltage AC applications, and new safety ground trip for DC applications with thermal protection against burnouts; also Joy power-distribution systems and equipment.

**National Mine Service Co.**—NMS-45 and NMS-68 controllers.

**Ohio Brass Co.**—Types AF, BF, BH and BFG (permissible) motor starters; Types LG, KG and M distribution boxes.

**Post-Glover Electric Co.**—P-G resistors and transfer switches.

**Reliance Electric & Engineering Co.**—AC and DC motors, gearmotors and V*S drives, including reliance precision-built AC motors with Reli-X insulation, prelubricated bearings and motor-lead indexing.

**Westinghouse Electric Corp.**—Electric motors and controls, De-Ion circuit breakers and lighting.

NEW—Power Centers, switch houses and selenium rectifiers.

## Electrical Wire, Cable, and Specialties

**American Steel & Wire Co.**—Mining cables, feeders, trolley wire and bonds.

**Anaconda Wire & Cable Co.**—Mine-power, shovel and other cables.

NEW—shuttle-car cable.

**Electric Storage Battery Co.**—Exide storage batteries for every type of mining application.

**Elreco Corp.**—Elreco section insulators, quick-break switches, expansion bolts, hangers, clamps and fittings.

NEW—Elreco inverted-trolley system, fused trolley tap, "J" hook for hanging wire and pipe, 1,500,000-cir mil combination feeder and trolley clamp, and slider-type trolley shoe and harp.

**Ensign Electric & Mfg. Co.**—Ensign rail bonds, trolley-guard supports and cable-splicers.

**Erico Products, Inc.**—NEW Cadwell process for splicing cables by welding—No. 8 through 4/0 Type W and twin Type G cables.

**Flood City Brass & Electric Co.**—Trolley-line material, fused switches.

**Gould National Batteries, Inc.**—"Plus-Performance Plan" to conserve and extend battery power.

**Joy Mfg. Co.**—Cable connectors and vulcanizers.

NEW—magnetic-lock connector for extending mine cable, push-pull connector with shroud.

**Mosebach Electric & Supply Co.**—Overhead line material, other electrical specialties, including cable snubber, feeder switches and rail bonds.

**Ohio Brass Co.**—Overhead line material, rail bonds and locomotive current collectors.

NEW—Form-H and Form-J taps, their six contacts and their terminals for every cable attachment.

**Okonite Co., Hazard Insulated Wire Works Div.**—Complete line of electrical wires and cables, stressing Hazacord flame—and weather-resisting cords and portable cables.

**Penn Machine Co.**—Super-Weld rail bonds, including Everlast reversible bond and wedge bond.

**John A. Roebling's Sons Co.**—Roebling electrical wires and cable for mines.

**Rome Cable Corp.**—Complete line of Rome 60 portable cords and cables, including parallel-duplex shuttle-car cables.

**Simplex Wire & Cable Co.**—Complete line of insulated wires and cables for mine use.

**Standard Devices Co.**—Standard trolley taps and cable connectors.

**United States Rubber Co., Electrical Wire & Cable Dept.**—Machine and locomotive cables, telephone cables, borehole and shotfiring cables, shovel and dredge cables.

**Westinghouse Electric Corp.**—Trolley-line material.

## Power Transmission

**Aeroquip Corp.**—Aeroquip flexible hose lines equipped with Aeroquip detachable and reusable fittings; Aeroquip self-sealing coupling.

**Allis-Chalmers Mfg. Co., General Machinery Div.**—Texrope drives, Texslide motor bases.

**Cleveland Worm & Gear Co.**—Speed-reduction units for mining equipment.

**Dodge Mfg. Corp.**—Dodge power-transmission equipment, including couplings and takeups.

NEW—Torque-Arm speed reducers, Taper-Lock steel conveyor pulleys.

**Link-Belt Co.**—Hydraulically operated P.I.V. variable-speed drive.

**Pittsburgh Gear Co.**—Armored-construction gears and the taper-serrated armature shaft.

**Raybestos-Manhattan Co., Manhattan Rubber Div.**—Transmission belts, V-belts.

**Westinghouse Electric Corp.**—Gearing for power transmission.

## Bearings

**Ahlberg Bearing Co.**—Ahlberg line of X-change bearings and full line of precision ball bearings and mounted units.

**Bearing Service Co.**—Bearings for mining applications.

**Dodge Mfg. Corp.**—Dodge-Timken bearings.

**SKF Industries, Inc.**—SKF ball and roller bearings and pillow blocks.

## Wire Rope and Steel Products

**Alan Wood Steel Co.**—A. W. Algrip abrasive rolled-steel floor plate.

**American Chain & Cable Co., American Cable & Hazard Rope Divs.**—Wire rope for coal mining.

**American Steel & Wire Co.**—Wire rope and wire products.

**Armco Drainage & Metal Products, Inc.**—Steelox buildings, steel sheeting and Flex-Beam guard rail.

**Bethlehem Steel Co.**—Wire rope for underground and surface use.

**Broderick & Bascom Rope Co.**—Wire rope and braided safety slings.

**Colorado Fuel & Iron Corp.**, Wickwire Spencer Steel Div.—26 standard wire ropes.

**Jones & Laughlin Steel Corp.**—Wire rope and steel products.

**A. Leschen & Sons Rope Co.**—Hercules Red-Strand wire rope, slings and fittings.

**Macwhyte Co.**—Wire rope and slings of all types.

**Oliver Iron & Steel Corp.**—Industrial fasteners—machine, carriage, lag and special bolts; nuts, rivets, track bolts, plow bolts, tie rods, cap screws, U-bolts and eyebolts.

**H. H. Robertson Co.** — Galbestos roofing and siding, industrial ventilators.

**John A. Roebling's Sons Co.**—Roebling wire rope.

**Security Locknut Corp.** — Security locknuts.

**Union Wire Rope Co.**—Wire rope for mining applications.

**Upson-Walton Co.** — Upson-Walton wire rope and fittings.

**United States Steel Co.**—Steel products for mines.

## Lubrication

**Ashland Oil & Refining Co.**—Mining and industrial lubricants.

**Cities Service Oil Co.** — Mining lubricants; specialty products, including rust preventives and removers, solvents and core oils; and the Power Prover for checking engines.

**D-A Lubricant Co., Inc.** — Heavy-duty oils and lubricants.

**Farval Corp.** — Farval centralized lubrication systems, including the recently developed Farval spray valve for lubricating open gearing and slide surfaces.

**Gulf Oil Corp.**—Mining lubricants, including Gulf mining-machine lubricant B and Gulf mine-car grease.

**Lincoln Engineering Co.** — Automatic, semi-automatic and manually operated centralized lubricating systems; heavy-duty power-operated drum pumps, bucket pumps, grease guns, fittings and accessories.

**Pure Oil Co.**—NEW line of industrial oils and greases.

**Shell Oil Co.**—Mining lubricants.

**Socony-Vacuum Oil Co., Inc.**—Correct lubrication of mining equipment.

**Standard Oil Co. (Ohio)**—Oils and greases, including new types.

**Standard Oil Co. (Indiana)**—Oils and greases for mining.

**Stewart-Warner Corp., Alemite Div.**—NEW Accumeter centralized lubricating system; lubricant-handling equipment.

**Texas Co.**—Texaco mining products.

**Tide Water Associated Oil Co.** — Complete line of mining lubricants.

**Traban Engineering Corp.** — Fully automatic lubricating systems for loaders and shuttle cars powered from hydraulic systems.

## Renewal Parts

**Clarkson Mfg. Co.**—Clarkson Uni-Flights and Uni-Flight conveyor chains.

**Flood City Brass & Electric Co.**—Repair parts for mining machines and locomotives.

**Goodman Mfg. Co.**—Genuine Goodman supply parts.

**Jeffrey Mfg. Co.**—Replacement parts and accessories.

**Joy Mfg. Co.**—Mechanical and electrical component parts for Joy machines.

**Kensington Steel Co.** — Kenkrome (alloy manganese steel) chains and renewable-tooth sprockets for preparation plants.

**Mining Machine Parts, Inc.**—Maintenance and repair parts for underground coal-loading equipment, including bronze helical gears for 14 BU loaders, mating pinions, the MMP improved square-head-rivet crawler chains, drive shafts, clutch disks and hubs.

NEW—"Loadmaster" universal conveyor chains.

**National Electric Coil Co.**—Products and services, including windings for motors and generators 1 to 50,000 hp or kva, electrical insulating materials, and motor and generator service.

**National Mine Service Co.**—Bemeco cable reel, intermediate gear with ball-bearing mounting, brush holders, swivel-type cable guides with sealed ball bearings, and other products, including "Locolite" sealed-beam headlights and replacement parts for all types of mining equipment.

**Ohio Carbon Co.**—Carbon products, emphasizing carbon and copper-graphite brushes for all types of mining motors and generators.

**Penn Machine Co.** — Replacement parts, particularly for loaders, cutters and locomotives, including helical, bevel and spur gears and pinions, splined shafts, worms and worm gears, solid-axle gears and continuous axle liners.

**Tool Steel Gear & Pinion Co.**—"Tool Steel" mining products.

## Maintenance

**American Brake Shoe Co., American Manganese Steel Div.**—Welding products, featuring a complete line of rods for hard-facing and repair.

NEW—tungsten-carbide rods.

**Blackhawk Mfg. Co.** — Hydraulic jacks up to 100 tons, wrenches and hand tools, hydraulic pipe blenders and knockout punches, plus the remotely controlled S-80 Porto-Power 50-ton hydraulic jacks applicable to any type of service.

**Chicago Pneumatic Tool Co.**—Impact wrenches and other maintenance tools.

**Coffing Hoist Co.**—Complete line of portable hoisting equipment.

NEW—hoist binder and coil-chain safety-pull ratchet-lever hoist.

**Duff-Norton Mfg. Co.** — Screw, ratchet and hydraulic jacks in 5- to 50-ton ratings; rerailing, loading-machine jacks.

**Dodge Mfg. Corp.**—Dodge "Slide-Set" vise.

**Harnischfeger Corp.**—Welding machines and electrodes.

**Manco Mfg. Co.**—Portable hydraulic Guillotine cutting and riveting tools, including portable hydraulic rivet squeezer for cutter bars and portable wire-rope and wire cutter.

**Martindale Electric Co.**—Motor and generator repair and maintenance-equipment line, including mica undercutters and saws, commutator grinders, "Commstones," armature repair tools, armature-testing instruments, electrical-testing instruments, metal-marking equipment, portable electric blowers, flexible-shaft grinding machines, circular metal-cutting saws, and rotary burrs and files.

**Templeton, Kenly & Co.**—Complete line of Simplex jacks for all mining applications.

NEW — "Re-Mo-Trol" hydraulic pumps and remotely controlled rams for pushing, pulling and lifting operations.

## Preparation

**Allied Chemical & Dye Corp., Solvay Sales Div.**—Solvay calcium chloride to allay dust and prevent freezing.

**Allis-Chalmers Mfg. Co.**, General Machinery Div.—Car shaker, solids pumps, rubber-lined slurry pumps and coal screens, including Ripl-Flo and Low-Head types.

**American Air Filter Co., Inc.**—Dust collectors and air filters, including Types N and W Roto-clones with wet-type dust collectors.

**American Cyanamid Co.**—Heavy-media preparation.

**Ashland Oil & Refining Co.**—Permatreat spray oils.

**Bird Machine Co.**—NEW Bird polisher.

**Bixby-Zimmer Engineering Co.** — Two vibrators with B-Z crown-mounted screens, featuring step-deck design for dewatering and sizing, and use of heavy-duty cloth at the feed end.

**Brown-Fayro Co.**—NEW high-pressure cold-oil spray equipment.

**Calcium Chloride Association**—Calcium chloride for freezeproofing.

**Centrifugal & Mechanical Industries, Inc.**—C-M-I centrifugal dryers, including the new Type "E."

**Colorado Fuel & Iron Corp.**, Wickwire Spencer Steel Div.—Wisco metal processing belts, super-tempered precision screens and perforated metals.

**Combustion Engineering Superheater, Inc.**, Flash Drying Div.—C-E Raymond flash-drying system.

**Nelson L. Davis Co.**—Two-stage-processor heavy-media cleaning plant, packaged cleaning plants and custom-built washeries.

**Deister Concentrator Co.**—Super-Duty Diagonal-Deck coal-washing tables and Conceneo revolving feed distributors.

**Deister Machine Co.**—Plat-O coal-washing tables and Deister vibrating screens, including unit-type vibrating mechanism.

**Denver Equipment Co.**—Flotation for the recovery of coal fines.

**Dings Magnetic Separator Co.**—Crockett magnetic separator for heavy-media processes; deep-burden rectangular suspended magnet and electro- and permanent-magnetic pulleys for tramp-iron removal.

**Fairmont Machinery Co.**—Chance sand-flotation process.

**Hendrick Mfg. Co.**—Sizing, dewatering and testing screens.

**Hewitt-Robins, Inc.**—Eliptex dewaterizers and Vibrex screen with new spring mounting.

**Heyl & Patterson, Inc.**—"Drying Dutchman" (Reineveld centrifugal dryer), standard Cyclone thickeners for water-clarification.

**Robert Holmes & Bros., Inc.**—Baughman "Verti-Vane" thermal drying equipment; laboratory crushers and pulverizers.

NEW—Holmes "Verti-Vibe" vertical-action screen.

**John A. Roebling's Sons Co.**—Woven-wire screens and cloth.

**Kanawha Mfg. Co.**—**Fuel Process Co.**—Kanawha-Belknap duplex washer; automatic controls for maintaining constant specific gravity and uniform solution level.

**Link-Belt Co.**—L-B Multi-Louvre drier, L-B float-sink concentrator for heavy-media coal cleaning, CA double-deck vibrating screen, and L-B oscillating conveyor.

**Ludlow-Saylor Wire Co.** — Sta-Smooth even-surface screens; Sta-Tru, Sta-Clear and Rex-Tang long-opening screens; special abrasion-resisting Super-Loy square-opening screens; woven-wire screens and wire cloth; corrosion-resisting wire cloths and screens.

**Manu-Mine Research & Development Co.**—Improved coal crusher.

**McLanahan & Stone Corp.**—Crushing equipment.

**McNally Pittsburg Mfg. Corp.**—Coal washing, dense-media separation, centrifugal drying, heat drying and general preparation, featuring McNally-Tromp dense-media washer, McNally-Pulso coal drier and Mogul washer.

**Peterson Filters & Engineering Co.**—Peterson disk filter.

NEW—Peterson TFR (top-feed-reservoir) vacuum filter for ⅛ x 0.

**Pennsylvania Crusher Co.** — Pennsylvania Bradford breakers, ring-hammer granulators and single-roll crushers.

**Productive Equipment Corp.**—Gyroset and Gyrette dewatering and sizing screens.

**Roberts & Schaefer Co.**—Hardinge counter-current heavy-media separator, R&S Super-Airflow pneumatic cleaner, R&S Hydrotators.

**Screen Equipment Co., Inc.**—Seco vibrating screens.

**Simplicity Engineering Co.**—Simplicity horizontal and Simpli-Flow single-deck screens; Simplicity Os-A-Veyor feeders and conveyors.

**Stearns Magnetic Mfg. Co.**—Stearns magnetic equipment for tramp-iron removal and heavy-media recovery.

**W. S. Tyler Co.**—Ty-Rock vibrating screens, Ro-Tap testing-sieve shaker and Tyler standard screen-scale testing sieves.

**Wedge Bar Screen Corp.**—Wedge Bar dewatering screens.

**Wedge Wire Corp.** — Kleenslot wedge-wire screens, including installation on vibrators without material changes.

**Western Machinery Co.**—Wemco Mobil-Mill incorporating Wemco drum separator, Wemco coal spiral, laboratory- and commercial-size Fagergren flotation machines, and Wemco heavy-media coal-cleaning equipment.

**Yara Engineering Corp.**, Interstate Equipment Div. — Interstate aerial tramways, including conveying-type units up to 400 tph and self-dumping jib-back units with 10-ton carriers.

## Safety and Communication

**Acme Machinery Co.**—Track- and rubber-mounted spray cars.

**American Mine Door Co.**—Little Chief rockduster on rubber tires or equipped with winch for placing on or removing from belt conveyors.

**Baker-Raulang Co.**—Baker Trike for low seams.

**Brown-Fayro Co.**—NEW 35-man 8-wheeled double-truck man-trip car especially designed for convenience and comfort.

**Calcium Chloride Association**—Calcium chloride for laying dust on shuttle-car runways, other dust-allaying applications, fire protection and ice control.

**Differential Steel Car Co.**—Differential man-trip cars.

**Farmers Engineering & Mfg. Co.**—Trolleyphone applications.

NEW—Plug-in Trolleyphone.

**Fyr-Fyter Co.**—Full line of portable fire extinguishers, including Karbaloy instant-model equipment for fire cars.

NEW — Stainless-steel dry extinguishers.

**Lee-Norse Co.** — Model TJ1 "mine jeep" for track transportation of men, key personnel or officials.

**Manu-Mine Research & Development Co.**—Portable automatic car stop, dust-control equipment, reflectorized tunnel paints, fire-retardant paints, etc.

**Martindale Electric Co.**—Martindale protective dust masks.

**Mine Safety Appliances Co.**—Improved mine illumination, dust-collection in roof-bolting, cleaner and safer mining machinery, better respiratory protection, and more-efficient rock-dust distribution. Specific equipment items include: M-S-A bolt-hole cleaner, M-S-A all-electric steam cleaner, Edison R-4 cap lamp, M-S-A self-rescuer, Bantam and FaceDuster rockdusting machines, M-S-A Precolator and a complete line of other safety equipment.

**National Mine Service Co.**—Wheat "Forty-Niner" cap lamps; new-design Koehler flame safety lamp.

**Raybestos-Manhattan, Inc.**, Manhattan Rubber Div.—Trolley-wire guard.

**Safety First Supply Co.**—Complete line of safety equipment, including rail clamps, welding helmets, safety belts, yellow-flash lights, portable drinking fountain and self-contained breathing apparatus.

NEW—laminated foil cloth, portable safety shields, miners' caps and hats, eye protectors, respirators, resuscitators, gas indicators and alarms, safety clothing and a goggle-cleaning station.

## Mining Specialties and Services

**Baltimore & Ohio R. R.**—Promotion of bituminous-coal use.

**Bowdil Co.**—NEW versatile lightweight aluminum telescoping transit support for mine surveying.

**Coal Mine Equipment Sales Co.**—Mining equipment.

**Elliott Service Co.**—Coal-mine bulletin service and Management Information service.

**Manu-Mine Research & Development Co.**—Mine-car preservatives; soil solidification for sealing wet or fluid areas by chemical injection.

**Tamping Bag Co.**—Weed and brush killer for mine, substation and right-of-way applications.

**The following organizations will be represented at the exposition but detailed reports regarding their exhibits were not available at the time this summary was prepared:**

**Complete-Reading Electric Co.**
**General Electric Co.**
**Hubbard & Co.**
**Quaker Rubber Corp.**
**Salem Tool Co.**
**S. K. Wellman**
**Whitney Chain Co.**

FIG. 1—AUTOMATIC suction-lined-primed 450-gpm centrifugal.

FIG. 2—SUCTION-LINE-PRIMER TANK for controlling small units.

# Automatic Control of Small

## Types of Automatic Controls
## Mine Applications and Operation
## The Benefits of Automatic Control

By W. H. LESSER
Mechanical-Electrical Engineer, Pierce Management, Scranton, Pa.

AFTER LONG PERIODS of continuous service in mines, automatic controls for small centrifugal pumps have proved to be simple, reliable and capable of effecting lower pumping costs. Because they include suction-line primers instead of conventional motor-driven priming pumps, it is possible to use them in small pumping stations without unduly increasing their cost.

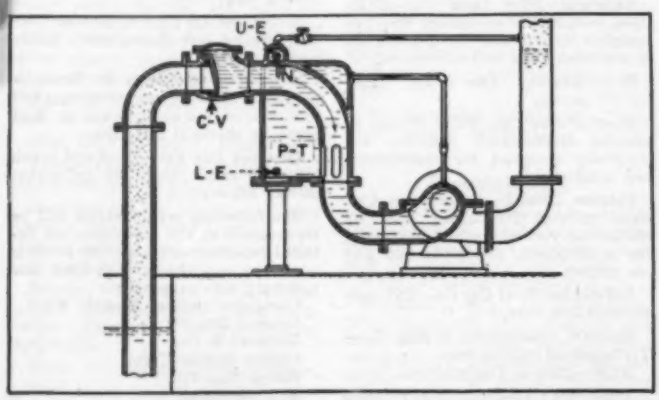



FIG. 3—INSTALLATION of suction-line primer.

Where continuous operation of small, isolated pumping plants is essential to the operation of coal and metal mines, these automatic controls eliminate the need for attendants whose chief duties, in the absence of such controls, are priming, starting and stopping small centrifugal pumps. Naturally, under these conditions, the cost of operating labor per gallon of water is very high and cannot be compared with the same cost item in a larger pumping plant. Satisfactory experience with the newer controls is evidence that this situation can be corrected.

Automatic controls for small pumps differ importantly from those developed years ago for large pumping stations for these reasons: (1) they are simple and less expensive; (2) they generally are installed in isolated areas of the mine where a pumping interruption does not reduce mine production too seriously; and (3) they are adaptable to installations where the possibility of frequent changes in location make it logical to build inexpensive pumprooms.

The newer controls are designed primarily for small centrifugal pumps and do not include expensive motor-driven priming pumps and the other accessories used in

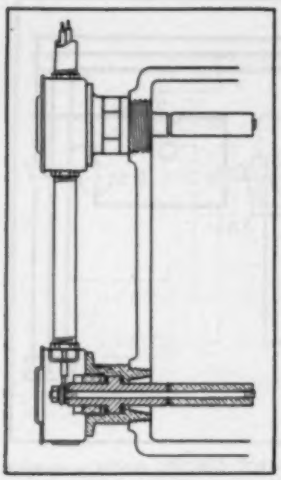


FIG. 4 PRIMING-TANK electrodes.

FIG. 5—SUMP electrode.

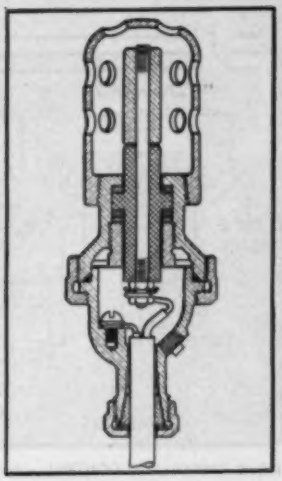


FIG. 6—SUMP-ELECTRODE detail.

# Centrifugal Pumps

the control of large pumps. They have been applied to pumps with capacities ranging from 50 to 1,500 gpm against heads as high as 600 ft.

A typical centrifugal pump installation with an automatic suction-line primer is shown in Fig. 1. It has a capacity of 450 gpm against a head of 475 ft.

## The Suction-Line Primer

A suction-line primer consists of a priming tank (Fig. 2) placed in the suction line of a centrifugal pump. When a primer of this type is used, the pump operates as a wet vacuum pump during the priming period. After priming it ceases to function as a wet vacuum pump.

As shown in Fig. 3, an installation of a suction-line primer installation includes: a suction check valve, C-V, above the level of pump; a priming tank, P-T; upper and lower electrodes, U-E and L-E; and a ¼-in air-relief pipe between priming tank and discharge line. The simplicity and lack of moving parts of the priming equipment are quite evident.

• **Primer Operation**—The operation of a primer (Fig. 3) is as follows: After the pump is installed and ready to operate, fill the priming tank, P-T, the pump and part of discharge line with water. Then start the pump, which draws water from the tank into the discharge pipe. This creates a vacuum in the tank. Consequently, air is drawn into it from suction line through the check valve. When the tank is empty, the pump is stopped, thereby permitting water previously pushed into the discharge line to flow back through the pump into the tank, where it forces air, drawn from the suction pipe, into the discharge line through the air-relief pipe. After all the air is expelled from tank, the pump is started again to repeat the cycle until it is primed.

This question may be asked: "How many starts are required to prime a certain suction line?" It depends, of course, upon the suction lift and the diameter and length of the suction line. If priming tank capacity is suited to the volume of a suction line, the first prime should be made after two to four starts of a pump. These starts, however, will be necessary for only the first prime. After that, the pump remains primed and will, therefore, get away at the first start.

A suction-line-primed pump remains primed when stopped, provided all joints in the suction line are tight and the check valve is in good condition. Air leakage into a non-operating pump through the stuffing boxes is impossible, since they are under discharge-line pressure. A small volume of air, however, remains in the priming tank while the pump is running. That air, when the pump stops, serves as a cushion, making it possible for the suction check valve to close gently.

When the pump is running, water from the suction line flows through a long-radius elbow built into the priming tank. Thus, friction loss is reduced to a minimum. Air entrained with water or leaking through stuffing boxes accumulates in the top of the priming tank. It must be removed or the primer will not function. This is accomplished by an eductor-nozzle built into the elbow. Water rushing past the nozzle draws air into the stream, which carries it to the discharge line.

• **Automatic Primer Operation**—To obtain automatic operation of a suction-line-primed pump, consisting primarily of starting and stopping it in accordance with high- and low-water levels in a sump, the following equipment is necessary: priming tank, Fig. 2; high and low electrodes in tank, Fig. 4; a magnetic starter; high and low electrodes in sump, Fig. 7; a two-pole relay, R, Fig. 8; a small transformer, T, Fig. 8, to produce current in the event AC is used; a suction-line check valve, C-V, Fig. 3; a control board, Fig. 9.

Assuming sump and priming tank are full of water, the pump will start because top electrode, SE, in the sump, Fig. 7, and in the

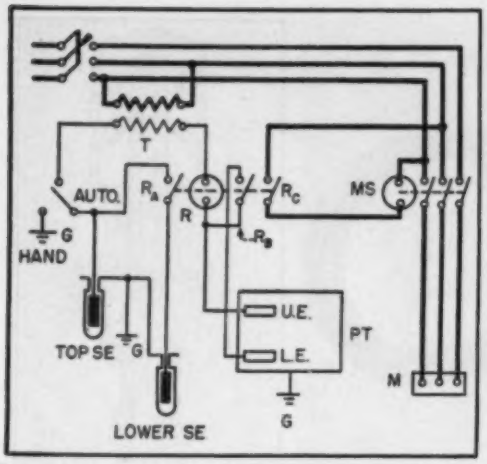



FIG. 7—AUTOMATIC CONTROL, auto-pump or suction-line primer, two-sump-electrode control.

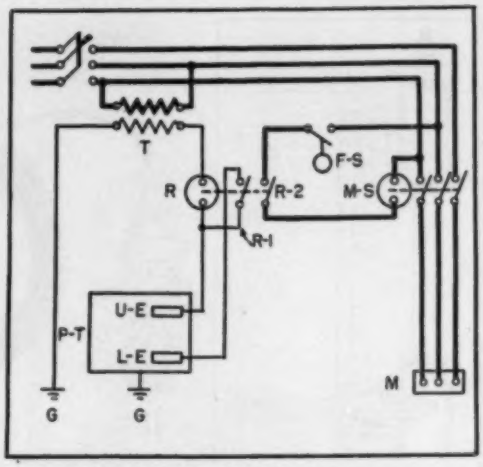



FIG. 8—AUTOMATIC CONTROL CIRCUIT, showing components employed to achieve automatic operation.

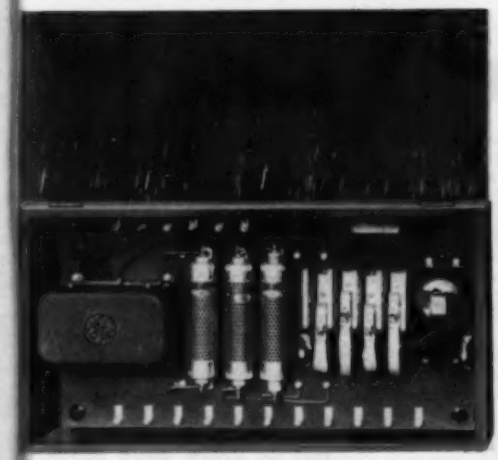


FIG. 9—CONTROL BOARD for use in automatic pump-control installation for small centrifugal.

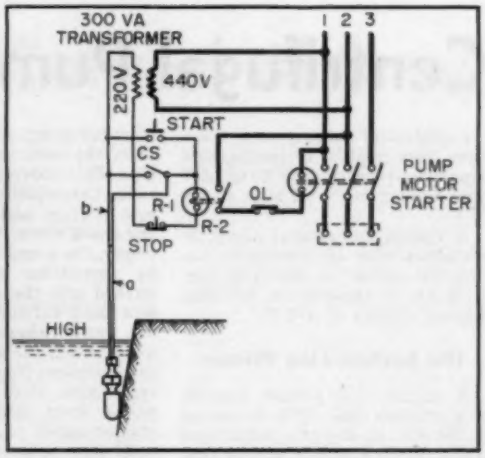



FIG. 10—AUTOMATIC CONTROL of small centrifugal pump with one sump electrode.

tank, Fig. 4, are submerged in water. But if there is no water in the sump, the pump will not start because both low electrodes are out of the water. After the initial priming operation, a priming tank can become empty only as a result of air leakage through a suction check valve or pipe joints.

Many pumps now in operation are equipped with either a sump float switch or sump electrodes, together with a time clock. These make it possible to operate pumps in accordance with time periods as well as sump-water levels. To make the equipment entirely foolproof, a time relay may be used to limit the number of starts and stops during a priming period.

It is possible to place a bell or horn in a control circuit to warn a foreman or mechanic of failure of a pump to start. This safety precaution, plus a relay limiting the number of starts, are desirable since a blocked strainer or an air leak may make the operation of a pump impossible, while at the same time it would start and stop until starter broke down.

Existing manually operated centrifugal pumps can be made automatic, at a relatively low cost, by the installation of a suction-line primer and necessary equipment.

• **Sump Electrodes**—An accessory of importance in any automatic mine pumping plant is a sump electrode, Fig. 5, applicable in locations where it is impossible to mount the pulleys, chains and counterweights of a float switch. Its heavy construction, Fig. 6, plus the use of acid-resisting metals, make it resistant to a highly acidulous mine water.

A typical ac control diagram for an automatic pump using two electrodes (high and low-water level) is shown in Fig. 7. The low-water-level electrode, Fig. 10, may be eliminated, after which a pump will stop when air enters the pump

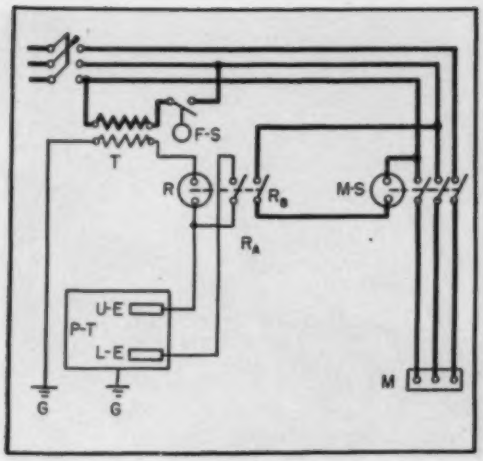



FIG. 11—AUTOMATIC CONTROL, auto-pump or suction-line primer, sump-float-switch control.

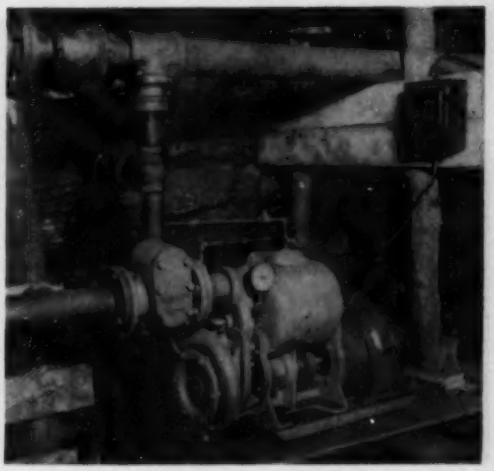


FIG. 12—AUTO-PUMP with a capacity of 300 gpm, 50-ft head, in mine-dewatering service.

after the water is lowered to a point where it enters the bottom of the suction pipe, thus exposing lower tank electrode, which stops the pump.

Fig. 11 is the control for an installation with a float switch instead of electrodes. The legends for Figs. 7 and 11 are:

| | Two Sump Electrodes | Float Switch |
|---|---|---|
| Motor | M | M |
| Magnetic starter | MS | MS |
| Primer tank (suction-line primer) | PT | PT |
| Upper tank electrodes | UE | UE |
| Lower tank electrodes | LE | LE |
| Control relay | R | R |
| Top and lower sump electrodes | SE | none |
| Float switch(sump) | none | FS |
| Control relay | R | R |
| Isolating or step-down transformer | T | T |

A brief survey of the use of automatic suction-line-primed centrifugal pumps of a certain type shows 97 in operation, of which 50 are in anthracite mines, 30 in bituminous mines and 17 in metal mines. Their sizes range from 3 to 8 in. Reports from operating men indicate good results with suction-line primers, since they are simple, reliable and low in cost. Experience over long periods of time shows that regular attendants can be eliminated and that repair costs are low.

## The Auto-Pump

When compactness and mobility are of prime importance, the auto-pump, Fig. 12, has been used successfully. In this type of pump a vacuum is produced by air displacements. Rarefied air, therefore, can be removed very quickly. Furthermore, the pump has a higher over-all efficiency than conventional self-primed pumps since the priming tank is filled completely with water when it is in operation. Also, water from the suction pipe flows in a smooth path through an inlet casting directly into the impeller, thus eliminating waste of power. The pump does not handle a mixture of air and water, which makes it possible to use a more efficient unit.

These characteristics of the auto-pump make it impossible for it to "snore"; that is, draw in air and water at the same time. Conventional self-primed pumps handling a mixture of air and water are more liable to corrosion and erosion than pumps taking water without air.

In designing auto-pumps the priming tank may be made of cast iron even though the acidity of the water is such as to require chrome-iron impellers. The reason is that the water in the priming tank is at rest when the pump is running.

• **How Suction-Line-Primed Pumps Perform**—Examples of large bituminous coal mines using automatically controlled suction-line-primed pumps include one operation with six such units in service. Sizes range from 4 to 6 in. To determine whether they would meet the requirements of the existing pumping problem, a test installation was made on two pumps 3 mi underground and 30 ft below the level of the haulage road. These pumps were so important that a 2-hr service interruption would result in both loss of the pumps and motors, plus the output from several coal-producing faces. It was decided that if the primers and controls proved successful in this—the most important isolated pumping plant—they could be applied to the other four pumps.

The operation of both test pumps proved entirely satisfactory. Consequently, the remaining pumps were similarly equipped. It then became evident that three regular pumpmen could be assigned to other duties. At present one man, who tours the mine on the third shift, is required to supervise the operation of six pumps. In addition, he supervises the charging of battery locomotives. Once a week a mechanic inspects the pumps for the purpose of making repairs which he considers necessary.

Automatic pump controls capable of meeting the exacting requirements of mine pumping plants have demonstrated their practicability in large central pumping stations and in small isolated plants. The results at many mines are: (1) a reduction of regular supervisory labor; and (2) lower repair costs, especially in central pumping stations where controls prevent the operation of a pump when equipment defects develop.

SPOIL-BANK BENCH for receiving unmarketable top coal is constructed by bulldozer and stripping shovel.

SAFETY for shovel and operator is increased as shovel trims highwall to dislodge loose rock.

### Maneuverable Units Provide Maximum Flexibility for Successfully . . .

# Strip-Mining Pillar Coal

## Hard Rock Overburden, Low-Quality Top Coal and Pillar Extraction Complicate Operations—Rubber-Tire-Mounted Loading Shovel, Fast Stripping Shovel and Horizontal Drill Speed Recovery of Pittsburgh-Seam Coal

HARD SANDSTONE OVERBURDEN, a 5-ft-thick layer of presently unmarketable top coal and the difficulties of stripping pillar coal from old workings are problems encountered by the M. & I. Coal Corp., Greensburg, Pa., at its Slickville, Pa., operation. Headed by J. F. Weaver, president, the company uses a horizontal 6-in drill and dynamite primed with detonating fuse to break the solid highwall, spoils the low-quality top coal—for the present—on a bench on the spoil bank, and employs maneuverable stripping and loading units to speed recovery of the irregular pillars.

In this area, the Pittsburg seam, 6 ft thick, lies under the top coal, from 18 to 30 ft of rock and a shallow cap of topsoil. The coal in the seam proper is suitable for metallurgical use and is hauled by contract truckers from the pit to nearby coke ovens.

• **Operating Sequence**—To start the stripping, topsoil is pushed from the brow of the highwall to prevent mud slides into the pit. The highwall then is drilled and shot, as explained later in this article, and the stripping shovel spoils the rock. Bulldozers push the spoil cast by the shovel to level the bank, then construct a bench on the pit side of the spoil bank to receive the top coal. The shovel lifts the top coal and deposits it on the bench, thus concentrating the top coal in windrows in the spoil area.

The Pittsburgh-seam pillars are taken by a ½-yd loading shovel to complete the cycle. However, drilling is done in the rock near the interface of the top coal and rock. To raise the drill to this level a drilling bench is constructed by the dozers from some of the spoil, a portion of which must be recast by the stripping shovel as it cleans the new cut.

• **Overburden Preparation**—Highwall drilling is done by a Hardsocg 6-in horizontal drill with hydraulic drive. The drilling head, equipped with six carbine-tipped finger bits, is propelled by 6-ft sections of auger-type steel.

Holes, spaced 15 ft apart along the highwall, are drilled on a slight pitch to provide good drainage. The drilling plan calls for 42-ft-deep holes but at the time the operation was visited the holes averaged about 32 ft in depth because of local rock conditions.

Two men using the horizontal drill placed eight holes in 5½ hr. Their duties included moving and setting the drill and adding and recovering auger sections.

Trito-X (LFC Chemical Co., Uniontown, Pa.), in 5¼x24-in cartridges, is used in blasting the highwall. Each cartridge contains 20 lb of dynamite, 74 cartridges being required to drop the 105x32x20-ft cut shown in the illustrations. Therefore, the explosive-to-rock ratio was about 0.6 lb per cu yd. Drill cuttings in paper tamping bags confine the charges in the holes.

The primer, threaded with Primacord, is the second cartridge placed in each hole, thus providing a detonator for all following cartridges. A No. 6 electric blast-

WORKING FROM BENCH built by bulldozer, horizontal drill makes 6-in holes 15 ft apart in highwall.

WATER-RESISTANT CARTRIDGES, each containing 20 lb of explosive, are primed with detonating fuse.

SHOOTING THE HIGHWALL—1,480 lb of explosive (left) cut about 2,500 cu yd of rock. Fragmentation is shown at the right.

ing cap is taped to the Primacord trunk line and the round is detonated through a reeled-out firing cable.

Drilling and shooting the cut illustrated required three man-shifts, including the full time of the driller and his helper and the half time of another company laborer and Jay Mangini, stripping foreman. Mr. Mangini supervised charging and firing and helped load the holes.

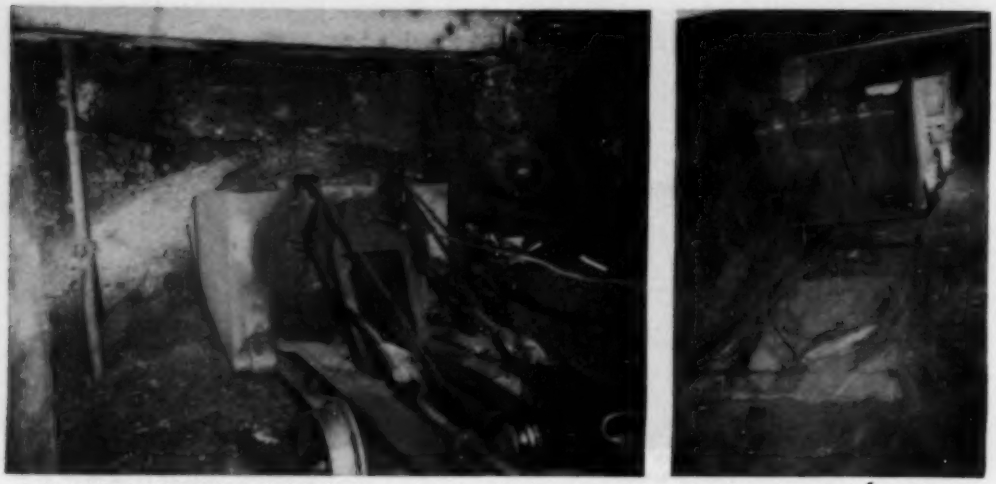
• **Stripping and Loading** — The stripping shovel is a Manitowoc Speedcrane, Model 3000, equipped with 24-ft boom, 18-ft dipper stick and 2-yd bucket. The unit is powered through a Torcon Model 7ED torque converter by a 6-cylinder, 175-hp Cummins diesel. Pneumatic controls operate on compressed air from a Gardner-Denver compressor. Stripping is a double-shift operation, as a rule, because of the quantity of rock that must be moved to provide enough pillar coal for single-shift coal loading.

A rubber-tire-mounted ½-yd Wayne Crane, particularly adapted to pillar-recovery because of its small size and maneuverability, loads the marketable coal.

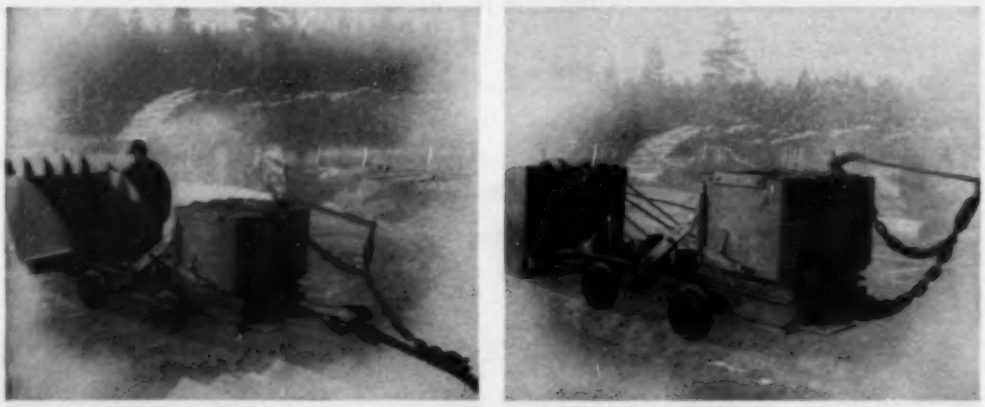
An Allis-Chalmers HD-19 and Caterpillar D-7 perform bulldozing jobs, such as removing topsoil, pushing spoil and maintaining access roads. Auxiliary units and their functions are a Willys Jeep truck for hauling explosives and a LeRoi Tractair 105 air compressor for drilling coal and oversize rock when necessary. American Cyanamid 40% standard gelatin is used for such blasting.

The pit is operated by nine men, not including truck drivers. They are: Mr. Mangini, two stripping-shovel operators, two tractor operators, two drillers, a loading-shovel operator and a utility man.

Surface operations are planned to take advantage of long rib lines in underground workings. Wherever possible, the highwall parallels these openings, thus giving the loading shovel an opportunity to work most of the time in coal as it follows the direction of the highwall.

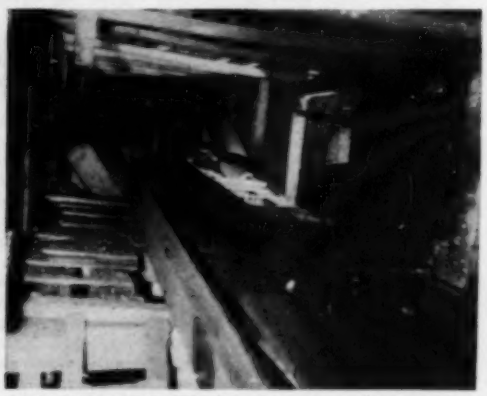


SCOOP LOADER IN ACTION. At the left, the scoop is shown buried in loose material after being dropped into the face. At the right, the scoop has been raised and the unit hoisted onto the rails immediately above the rerailing plate.



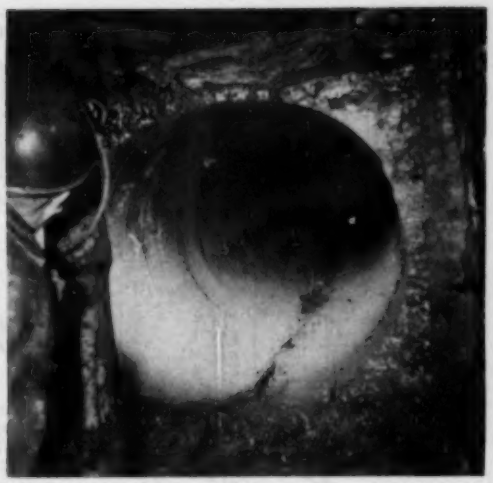
SCOOP-LOADER CONSTRUCTION. View at left, with bucket up, shows hitching, slotted drawbar and yoke for bucket-hoist ropes. View at right, with bucket down, shows stop engaging racks on back of bucket and bucket-hoisting ropes in sheaves.

LEVER for releasing bucket stop is demonstrated by man at right, with man at left showing use of drawbar locking pin.



SCOOP LOADER DUMPS into hopper under track at top of hoist through opening left between the rails.

SHORT ELEVATING CONVEYOR transfers coal from the under-track hopper filled by the scoop loader to mine cars on gangway.



BIG DRILL for crosscutting and boring of airways offers additional development savings at N.W.I.

# Efficient Pitch Development

## Scoop Loader Cuts Cost of Sinking Slopes up to 500 Ft or More in Pitches up to 50 Deg

## Big Drill Bores 42-In Airways up to 188 Ft or More and Provides Major Savings in Cross-Cutting

PITCH-MINING development is rendered quicker, easier, cheaper and safer by two special machines —one fairly recent and the other with a long history of use—at the Roslyn (Wash.) operations of the Northwestern Improvement Co. The older machine, known as a scoop loader, or "helldiver," is employed for speeding up mucking in sinking slopes in both coal and rock. The new machine is a big drill for boring crosscuts and other openings for ventilation. It also is being considered as a coal-production unit in combination with long-hole drilling and shooting of pillars.

One machine was originated and the other was brought to its present improved state by the N.W.I. operating staff, headed by the late Thos. Murphy, manager of coal operations. Others of the staff include: E. R. McMillan, assistant manager and chief engineer, Seattle, Wash; Harry Boyle, resident engineer; George Powe, assistant resident engineer and assistant superintendent; Frank Badda, superintendent of mines; Charles Rushton, safety engineer; A. Wallgren, engineering assistant; E. H. Brooks, electrical engineer; Jack Cadwell, mechanical engineer; William Weisman, foreman No. 9 mine; and George Miller, foreman No. 3 mine.

Operations are in the Roslyn and Big seams of the Roslyn-Cle Elum field, which is predominantly a large syncline or basin with smaller anticlines or domes in certain areas. The biggest producer is the Roslyn seam, approximately 54 in thick. Second in rank is the overlying Big Seam, averaging 62 in in thickness. It carries, however, a considerably higher percentage of refuse and, in addition, has a top that is prone to break and fall rather easily, thus complicating both room work and pillar extraction.

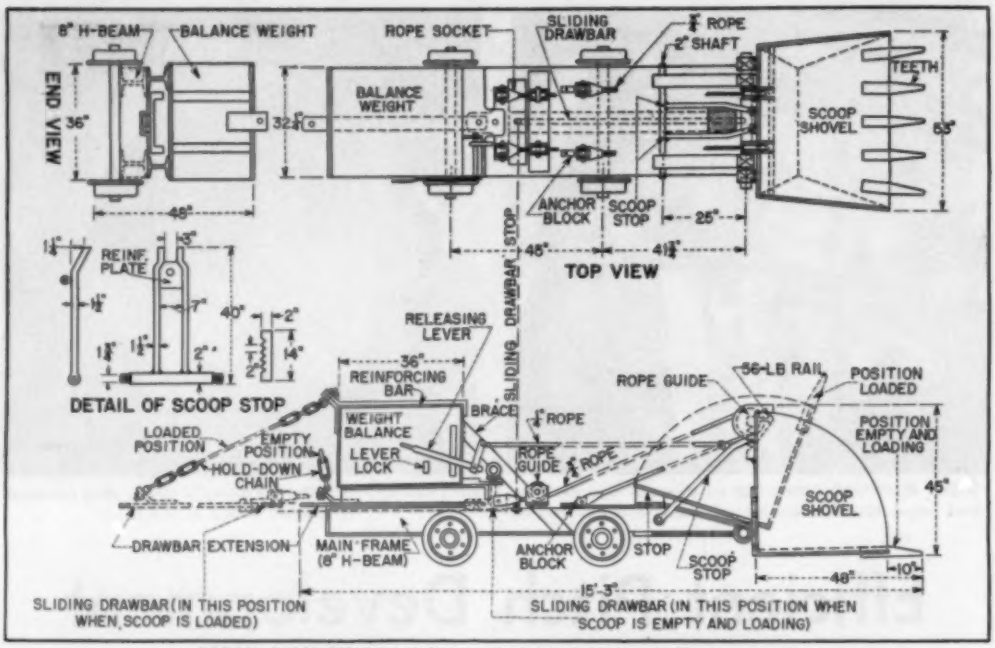
• **Pitch Development**—Pitch of the measures normally varies from 8 to 50 deg, with some of the coal along a fault running up to 80 deg. Because of the Cle Elum river overhead, it is not expected that mining will be done in this latter area. Elsewhere, however, every effort is made to achieve complete recovery where safety permits. As one of the steps in this direction, and to increase efficiency, the N.W.I. organization adopted cross-pitch mining with shaker conveyors and gathering chutes in 1940.

In this cross-pitch work, three headings are driven up the pitch from the gangway the desired distance. The center is reserved for a supply track and gathering chute. At times, when the pitch flattens near the gangway, the chute terminates in a shaker conveyor, which acts as a feeder and car loader.

Cross-pitch mining is done on the retreat, and when the service slope is raised to its limit, rooms are turned toward the old works. They are mined by cutting, drilling and shooting, with the coal sliding or being assisted to a shaker conveyor along the lower rib. The shaker discharges to the gathering chute in the center heading of the slope.

When a room is driven up, the pillar above is mined by open-ending it on a slanting face, with the bottom of the face far enough ahead in the direction of the room-

## Scoop-Loader Design and Operation Speeds Slope-Sinking at Roslyn




SCOOP-LOADER DESIGN, including details of slotted drawbar—the key component.

neck to provide an angle of 30 to 45 deg. The coal is shot off the solid, sometimes in lifts as deep as 10 ft, and is run to the room shaker in chutes. When the rooms on one side are completed, the process is repeated on the opposite side and finally, the chain pillars are removed to work out the panel. The system has proved highly successful on pitches up to 50 deg.

### Sinking Slopes With Scoop Loader

Development at the Roslyn mines is by rock and coal slopes—primarily the latter and usually straight down the pitch—in combination with gangways driven on the contours with a grade board providing for a grade of ¾% back to the slope. Occasionally, slopes and gangways are supplemented by a cross-measure tunnel.

The first scoop loader, or "helldiver," was installed in the old No. 5 mine in 1941 to sink a coal slope on a maximum pitch of 14 deg. It was built on the plans for the first unit developed by Gomer Reese, then operating in Wyoming. The next job was No. 10 manway, on a 40-deg pitch in rock.

The present machine is the third in the N.W.I. line and is considerably modified from the first.

Construction and operating details are shown in the accompanying photos and drawings. Essentially, the unit consists of a tilting scoop or bucket with a capacity of about 1 cu yd, with the necessary gear to lower the scoop for loading, to raise it for hoisting and to dump when desired. The secret is a sliding drawbar with a yoke, to which two ropes are attached and run through sheaves on the back of the scoop.

• **Loading With the Helldiver**—In loading with the helldiver the slotted drawbar is pulled back by the main hoisting rope, raising the scoop to carrying position. A hole in the sliding drawbar accommodates a pin, so that when the loader is pulled back off the dump the scoop will remain in the down position.

Another hole at the opposite end of the drawbar can be used to hold the loaded scoop in position and prevent dumping if the rope is slackened or the unit is stopped at any time during the hoist. Ordinarily, however, the pull of the hoisting rope is sufficient to hold the scoop in loaded position. Also, the weight of the scoop usually will hold it in down position while it is being dropped back to the face without using the locking pin. However, it is available for service when needed.

Total weight of the unit, including weight balance—a steel box filled with scrap iron at the rear end—is approximately 4 tons. For fast work in loading rock or coal, a hoist with a rope speed of 1,000 fpm is used. On a 40-deg pitch this requires a 150-hp motor.

As indicated by the preceding, the unit is operated throughout the cycle by a hoist, with only minor assistance from the men on the crew. To load, the unit, with the scoop in down position, is lowered to within about 40 ft of the face. At that point, the rope is permitted to run free, letting the scoop slam down into the coal or rock. Reversing the pull of the rope raises the scoop for hoisting.

The weight of the unit, combined with the speed built up in the free fall, is sufficient to slam the scoop through even large masses of rock. To prevent upward deflection of the scoop, however, particularly in rock, a stop also is provided. It consists of a pivoted brace mounted on the frame, with the outer end engaging slots in racks fastened to the back of the scoop. After loading, the brace is pulled back by a rope operated by a lever on the side of the weight box, as shown in the accompanying illustrations.

• **Dumping the Helldiver**—For dumping the scoop loader, a hopper normally is installed above the gangway, with a short elevating conveyor out of the hopper for loading the coal or rock into mine cars. Openings are left in the track over the hopper so that the scoop dumps through the rails directly into it.

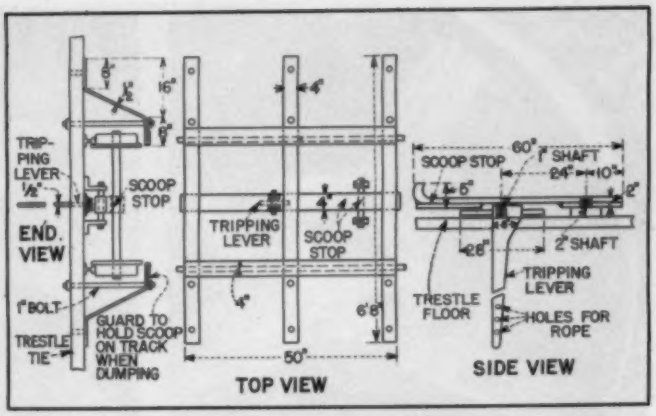
To permit dumping, a dog shown in the accompanying illustrations is employed. A lever on the bottom, with a rope to the hoistman's station, permits him to pull the horn of the dog down as the trip is hoisted or lowered. In hoisting, the horn is pulled down until the loader is above, whereupon the hoistman lets the horn come up and drops the loader back so that an axle is engaged. As the rope is slacked off, the weight of the scoop after the locking pin (if being used) is pulled tilts it forward to discharge the rock or coal. The hoistman then pulls the horn down to permit dropping the loader to the face for another cycle.

Ordinary rock will slide out of the scoop if the track at the dumping point is on a pitch of about 32 deg or more. Where the pitch is less, an alternate method makes use of a spur track and a bumping block at the end. The scoop is first lowered to the block and then is pulled up a short distance and permitted to slam back, tripping the scoop and ejecting the load.

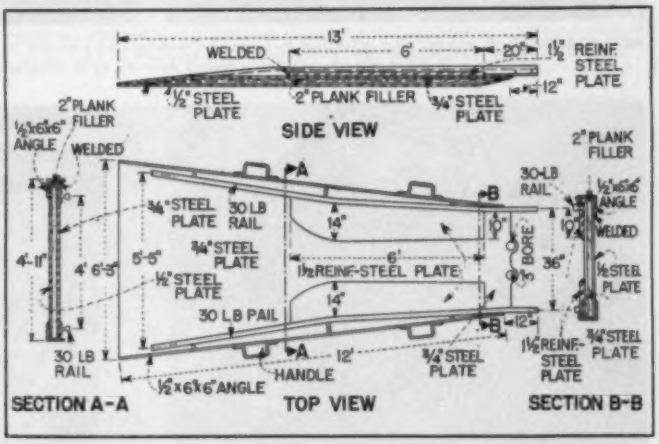
A special rerailing device is used at the face. Details are shown in accompanying illustrations. General practice, except where the bottom is very soft, is to let the loader run off the track and rerailing device and on down on the bottom up to 15 ft or so, thus reducing the number of times the rerailer must be moved. As the loader is pulled back after loading, the wheels ride up onto the noseplate of the rerailer and are guided to the track rails.

The scoop loader was designed primarily for sinking in rock but is used in either rock or coal. Maximum pitch used on to date is 43 deg. In the opinion of the management, sinking at more than 50 deg would be impractical unless some type of cover was designed for quick easy closing of the front of the scoop to prevent loss of material in hoisting.

Also, in the opinion of the N.W.I. management, the loader should not be hoisted much over 500 ft, although fairly good efficiency has been maintained up to 750 ft. Furthermore, if the slope is over 10 ft wide, it is felt that it would pay to use either two tracks or a three-rail track to permit reaching all parts of the face and thus reduce hand shoveling to a minimum.




DUMPING-STATION facilities include special stop operated by hoistman.



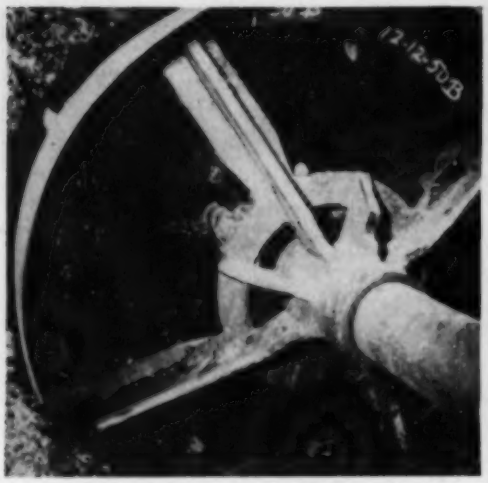

RERAILING PLATE used at face of slope in scoop-loader sinking.

• **Helldiver Results** — Performance in 54-in coal, with places approximately 10 ft wide, is about one cut 7 ft deep per shift with a three or four-man crew. Normally, one man operates the hoist and, with a hopper holding a full cut of coal (20 to 21 tons), the hoistman also can handle transfer to the mine cars. The 7-ft rate per shift includes installation of permanent track and permanent three-piece timber sets, plus lagging and other construction. Normally, after the slope is sunk, using blowers and tubing, aircourses or other side openings are raised through crosscuts. Lately, as detailed later in this article, airways are being drilled back up the pitch.

Specific jobs include a 750-ft rock slope on a 40-deg pitch, sunk in the summer of 1946. Three men were used at the face when drilling and blasting. When loading, one took care of dumping at the top while the other two handled mucking at the face. The slope was 12 ft wide and 8 ft high. An effort was made to use a track-type deflector that would direct the loader alternately left and right to cover the entire face. The necessary speed of drop, however, caused the loader to jump the rails.

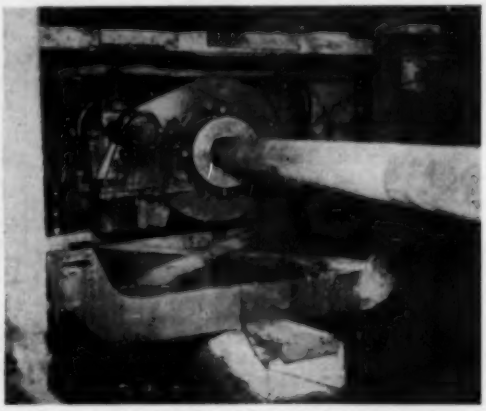
An average speed of 60 to 80 ft per month was maintained in sinking an 8x10-ft. manway in rock in May, 1944. The crew was three men in the slope plus a hoistman.

## Boring With Big Drill Cuts Cost of Making Airways and Crosscuts



NEW BORING HEAD includes pilot installation made up of oilwell-type bit preceded by finger bit (left). The right view shows the head in action with the coal being washed down by water introduced through the rods.

NEW-TYPE POWER UNIT for big drill includes hydraulic controls for all motions except turning the drill.



DRILL RODS are turned through setscrew-type chuck. Power is supplied by 20-hp motor (rear) through truck transmission.

The work breakdown in achieving a completed opening, including permanent timbering, was as follows:

| | |
|---|---|
| Loading rock | 33.76% |
| Drilling | 22.64 |
| Blasting | 8.40 |
| Safety timbering | 12.34 |
| Track | 15.10 |
| Manway steps | 1.90 |
| Ventilating duct | 1.80 |
| Clearing smoke | 2.76 |
| Pumping | 1.30% |

### Drilling Airways

In another attempt to cut the cost of development work the N.W.I. management began an investigation into the possibility of drilling airways and crosscuts as long ago as 1924 and 1925. The first attempt was to bore 6-in holes about 50 ft from gangway to counter. With the carbon-steel bits then available, it proved impossible with the sulphur balls and lenses characteristic of the seam.

With the advent of the carbide-tipped bit it was felt that the experiment could be renewed with more possibility of success. Consequently, a 42-in drill was built in 1948, and was followed by the present unit late in 1950, when it was found that the carbide bits would cut the sulphur without difficulty.

• **Original Drill Design**—The original cutting head was made from an old cast-steel clutch disk from a dragline. The diameter happened to be 42 in, which set the size of the holes presently being drilled, although a larger head is being contemplated. Ordinary cutter-chain bit blocks were welded to the disk, as shown in an accompanying illustration, and Kennametal bits were installed in them.

The drilling unit was built from an old steam-type Sullivan diamond drill. The advance, however, was only 12 in, materially reducing the time available for actual drilling.

In the meantime, Claude Mur-

phy, son of the N.W.I. manager, then at the Ravensdale mines of the company, decided to experiment with a smaller head of a convex type. In other words, the bits on the rim were ahead of those in the center. Thus, with the rim bits cutting a relieving kerf, the work of the others was more of a breaking rather than a cutting nature, considerably easing the drilling effort.

As a result of this experience, the new 42-in drilling head shown in the accompanying illustrations was built at Roslyn, along with a new drilling unit providing 5 ft of travel before taking a new grip on the drill rods with the chuck. Compared to the previous head, larger openings were provided for the escape of the broken coal.

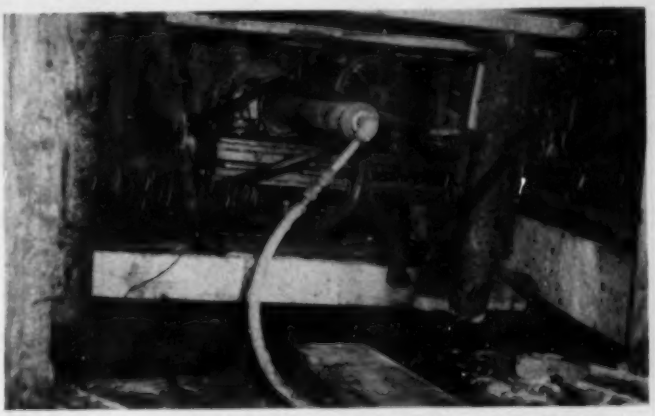
ORIGINAL BORING HEAD (left) was made of a flat-steel disk with bit blocks welded on as shown. A pilot rod (right) followed a small-diameter hole drilled in advance.

• **Pilot Bit Used in New Head**—The new drill head also was provided with a pilot bit. With the old, a small pioneer hole was first drilled and a round pilot rod was mounted in the center of the head to follow the pioneer hole. The new pilot bit consists of a rotary-type oilwell bit preceded by a small finger bit. It has given excellent results in keeping the main head approximately on line in spite of sulphur. Incidentally, if the main head does show a tendency to drift excessively, applying pressure to the rods at the mouth of the hole with a jack brings it rapidly back.

The drilling unit, also made in the N.W.I. shop, consists of a skid-type base supporting the drill carriage on a turntable. Height of the carriage is adjusted by a telescopic hydraulic jack in the center of the base. The drill carriage is advanced 5 ft by two 6-in hydraulic jacks underneath the carriage frame. The drill rods are driven by a 20-hp motor through a truck transmission. A second 5-hp motor operates the pump supplying the hydraulic system.

The drill rods are 4-in double-strength pipe with quick-acting thread-type, or spud, couplings. Thus, the outside diameter is uniform, permitting feeding of the rods through a chuck. Water is run up through the rods to cool the bits, allay dust, and, in lighter pitches, wash the coal down out of the hole.

To prevent loss of water during rod changes, rubber-ball checks are employed. As the water flows up, the balls are kept from moving up with it by cross wires inside the pipe. When the rods are broken, the balls seat on the tops of the inside collars forming part of the spud couplings. The result is a considerable saving in the time that otherwise would be required to fill the pipe after a new set of rods was inserted.

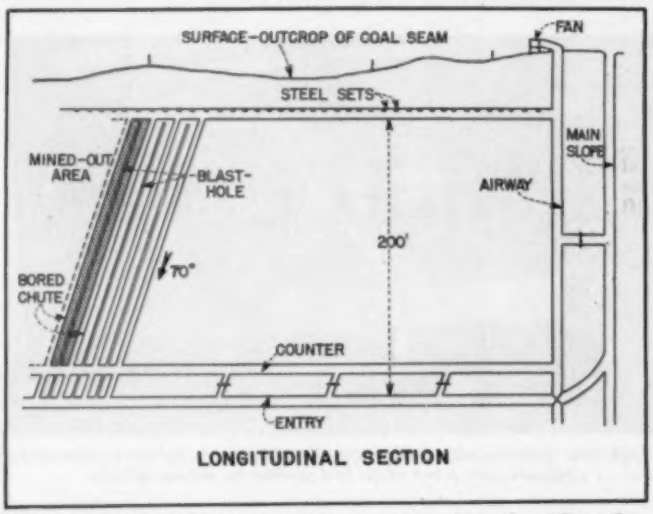


REAR END of drilling unit, showing water connection to rods, which are advanced by hydraulic jacks. A jack on the base positions the carriage vertically.

• **Drilling Cycle**—Drilling is done in 5-ft stages. When a 5-ft advance has been made, the rods are clamped ahead of the machine to hold everything in place, the chuck is loosened and the carriage retracted 5 ft. Then the chuck is tightened and drilling is resumed. At the moment, a search is being made for a new type of chuck, possibly hydraulic, that would provide a more positive grip than the set screws now used, and which could be engaged and disengaged in a relatively short time.

Rods are extended every 15 ft by breaking the column and adding three 5-ft sections. To prevent rod sag when the distance gets long, "stabilizers" are used every 20 ft or so. These consist of round spiders the same diameter as the hole. They are split to permit installation without disconnecting the rods, and are loose and held in place by split collars. When the stabilizers were clamped tightly to the rods and turned with them, they wore grooves in the coal and allowed the rods to sag much as if they had not been used.

N. W. I. MANAGEMENT and visitors: Tenta Aso (left), Aso Coal Mining Co., Japan; L. H. McGuire, chief, accident prevention and health division, USBM, Region II, Seattle; the late Thos. Murphy, manager of coal operations, N. W. I.; Harry Boyle, resident engineer; Frank Badda, superintendent of mines; Charles Rushton, safety engineer; A. Wallgren, engineering assistant; P. F. Yopes, mining engineer, Region II, USBM; Joe Mautino, tipple foreman, and George Miller, mine foreman, Mine No. 3.




PROPOSED STEEP-PITCH MINING PLAN based on boring chutes, then drilling pillars and shooting them out in sections starting at the top.

• **Drilling Results**—The new drill has been used so far for the purpose for which it was designed: boring crosscuts and airways. In the latter instance, although it has not yet been done, it is planned, if a large airway is necessary, to drill as many as three holes side by side and, in addition, if necessary, to shoot out the dividers and arch the top to get the required cross-section.

The unit has drilled 77 ft of hole in experimental work in 4½ hr. A complete cycle for 5 ft of advance, according to another check, requires 10 min, including inserting rods but not inserting the stabilizers used every 20 ft or so.

Five long holes had been drilled at the time this description was prepared, ranging from 140 to 188 ft in length and totalling 812 ft. In this 812 ft, 13 bits were replaced, meaning bits that had been ruined beyond repair.

Major savings are expected in the normal crosscutting between gangway and counter. At present, it requires three men approximately three shifts to drive a crosscut 40 to 50 ft. This does not include timbering and the cost of the stopping. The latter averages $50, whereas with the drilled crosscut it is contemplated that simple ⅛-in steel disks will be used. In drilling, also, results to date indicate that a crosscut can be put through easily in one shift with a three-man crew, including moving the machine in and taking care of other necessary preparation. With an improved chuck, it also was the feeling that the machine could be operated by two men instead of three, with no decrease in rate of advance.

Except in one apparently disturbed area where pressure was encountered, the holes stand up without sloughing and stay clean indefinitely. With smooth walls, resistance is materially reduced, and it is believed that volume through such holes when used as airways could be materially increased with no increase in water gage. Timbering or other support apparently will never be needed under normal conditions.

• **Drilling for Coal**—Use of the big drill as a production machine also is receiving the active consideration of the N.W.I. operating management. A tentative plan is shown in the accompanying illustration. It consists of boring chutes, then drilling and deck- or column-loading the intervening pillar and shooting it out in sections starting at the top. To prevent the coal from running to the worked-out of gob area, the holes are angled slightly across the pitch to keep the flow next to the solid coal.

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*1888 . . . DEPENDABLE BATTERIES FOR 63 YEARS . . . 1951*

# An Evaluation of Safety-Consciousness

## STANLEY M. WALKER, Bureau of Mines Engineer, Spotlights Management's Safety Responsibility by Showing That Top-Level Interest, or Lack of It, Does Make a Difference in Injury-Frequency Ratings

AFTER FIVE YEARS' EXPERIENCE in teaching accident-prevention to mine and quarry workers and officials, Mr. Walker quantitatively evaluates safety-consciousness, heretofore considered somewhat intangible, and summarizes his findings as follows:

1. Few men are inherently safety-conscious.

2. The behavior pattern of the safe worker is merely safety-consciousness in practice.

3. If safety-consciousness is not inherent, it must be derived from others, and ordinarily the others are the workers' supervisors.

4. The supervisors, in turn, look to their superintendents to provide good examples of safety-consciousness.

5. If the worker is to avoid injury, the top officials must point the way. You can't buy safety, and lip service to safety doesn't prevent injuries.

These findings were first presented to the Cement and Quarry Section, National Safety Council, in October, 1950, and published in March, 1951, by the Bureau of Mines in I. C. 7595.

**In developing his thesis,** Mr. Walker applies data secured from 62 companies to illuminate management's role in promoting safety-consciousness. Table I classifies the companies according to annual working time, which is a measure of company size, diversity of operation and exposure to hazard, Mr. Walker points out. Neither very small nor exceptionally large companies appear in the list. Therefore, a cross-section of average-size operations is represented.

Table II shows that six companies, all of medium size, according to the classification in Table I, were free of accidents for the year preceding the survey, while 14 companies had frequency rates above 50, two of these exceeding 200. The table shows a wide diversity of frequency rates, but neither the very-safe nor the very-unsafe predominate, emphasizing that the survey covers average properties.

In developing a pattern, Mr. Walker's next step was to rate the degree of protection afforded in the plant by equating an apparent need for such protection to the number of recommendations suggesting increased protection per 100,000 man-hr, the 100,000-man-hr unit permitting level comparison of the 62 companies studied.

Plant-protection ratings, according

**Table I—Working-Time Classification of Companies Studied**

| Number of Companies | Man-hours Worked, Annual Average |
|---|---|
| 5 | 100,000 to 250,000 |
| 17 | 250,000 to 400,000 |
| 21 | 400,000 to 750,000 |
| 14 | 750,000 to 1,250,000 |
| 5 | 1,250,000 or more |

FRONT-LINE FOREMEN need the help of management to get into lower injury-frequency brackets. Top-brass backing pays off, this study shows.

**Table II—Classification of Companies According to Frequency Rates**

| Frequency rates | | | | | | | Total |
|---|---|---|---|---|---|---|---|
| 0.0 | 0.0–2.5 | 2.5–5 | 5–10 | 10–25 | 25–50 | Over 50 | Companies |
| .. | .. | .. | .. | .. | 3 | 2 | 5 |
| 2 | .. | 4 | 2 | 3 | 1 | 5 | 17 |
| 3 | 2 | 3 | 3 | 3 | 2 | 5 | 21 |
| 1 | 2 | 1 | .. | 7 | 1 | 2 | 14 |
| .. | .. | .. | 3 | 1 | 1 | .. | 5 |
| 6 | 4 | 8 | 8 | 14 | 8 | 14 | 62 |

**Table III—Plant Protection According to Number of Recommendations**

| Frequency Range | Very Good | Good | Fair | Poor | Very Poor | Total Companies |
|---|---|---|---|---|---|---|
| 0.0 | .. | 5 | 1 | .. | .. | 6 |
| 0.0 to 2.5 | 1 | 2 | 1 | .. | .. | 4 |
| 2.5 to 5.0 | 2 | 6 | .. | .. | .. | 8 |
| 5.0 to 10.0 | .. | 5 | 3 | .. | .. | 8 |
| 10.0 to 25.0 | .. | 5 | 7 | 2 | .. | 14 |
| 25.0 to 50.0 | 1 | 1 | 2 | 4 | .. | 8 |
| Over 50.0 | .. | 1 | 4 | 7 | 2 | 14 |
| Totals | 4 | 25 | 18 | 13 | 2 | 62 |

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## How mine operator gets extra traction, more recaps per tire

THE PENOWA COAL COMPANY, Burgettstown, Pa., conducts both deep mine and extra mine stripping operations on their 5,500 acre holdings in northern West Virginia and southern Pennsylvania. The company operates some 75 vehicles ranging from 18-ton capacity dump trucks to a grader, deep mine shuttle cars and even jeeps.

Most of the trucks, of course, are big dump trucks and haul coal over unpaved roads of red clay, slag and stony shale. Tire traction is a major problem. If one truck bogs down, all operations stop until that truck moves.

"We switched to B. F. Goodrich Universal tires," says A. M. Gardner, purchasing agent, "after it was pointed out that trucks equipped with these tires could get through when others bogged down. At the present time, 95% of our equipment is on BFG tires." And Eldo Bruner, shop foreman, added, "The traction is far superior to that obtained with any other brand. After switching to nylon casings, we found that we were able to get many more factory recaps per tire and have less tire trouble."

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There's a special B. F. Goodrich tire for every off-the-road need . . . a special tread and special construction. And, of course, BFG's have the added protection of the patented *nylon shock shield*. Layers of strong, elastic nylon are built in between the tread rubber and the cord body, shielding the cord body by absorbing and distributing shocks and strain.

For tires for any type of mine service you can depend on B. F. Goodrich for extra service. *The B. F. Goodrich Company, Akron, Ohio.*

## When Top Officials Back Safety Courses, Attendance and Results Jump

**Table IV—Attendance According to Whose Time Was Involved**

| Classes Held On: | Number of Companies | Eligibles Attending, % | Students Completing, % | Average Frequency |
|---|---|---|---|---|
| Student's time | 21 | 87.7 | 70.5 | 48.7 |
| Half-and-half | 19 | 95.4 | 87.5 | 27.8 |
| Company's time | 22 | 96.8 | 84.4 | 23.5 |

**Table V—Attendance and Attitude**

| | Number of Companies | Eligibles Attending, % | Completions, % | Average Frequency |
|---|---|---|---|---|
| Top official attending and leading | 25 | 97.8 | 89.1 | 5.26 |
| Top official attending but not leading | 10 | 96.2 | 81.7 | 22.42 |
| Top official not attending but next official leading | 11 | 93.3 | 82.2 | 34.93 |
| Top two men not attending and not leading | 10 | 87.4 | 73.8 | 71.70 |
| Top three men not attending and not leading | 6 | 62.3 | 33.5 | 128.70 |

to the number of recommendations per 100,000 man-hr, are: very good, less than 1 recommendation; good, 1 or 2; fair, 3 or 4; poor, 5 or 6; and very poor, over 6 recommendations. In Table III, Mr. Walker classifies the plants in each frequency range of Table II according to this rating system of recommendations per 100,000 man-hr.

**Noting that a pattern** is beginning to appear, Mr. Walker draws this prime conclusion, among others, from Table III: Lack of protection shows in the high-frequency plants, as would be expected; however since none of the accident-free plants are classed as very good, it appears that some other factor is involved if injuries are to be prevented.

In seeking the other factors that might be involved, Mr. Walker investigated management attitudes. Assuming that perhaps scheduling of classes on-shift or off-shift might have an effect on safety performance, data were screened again and Table IV is the result.

Eligibles are all men from foreman to top-management at the plant. Completion requires participation in at least 8 out of 10 sessions.

According to Table IV, Mr. Walker reports, the pattern is taking definite shape. For the 62 plants studied, frequency is progressively lower and participation in the training effort is progressively higher as the training is performed more and more on company time.

**Next, Mr. Walker analyzed** the attitude of top officials as demonstrated in their actual participation in safety and accident-prevention instruction, and tabulated his findings in Table V.

Examination of Table V will show the pattern to be virtually complete, Mr. Walker states. At 25 companies, the highest-ranking official, usually general manager or plant manager, took keen interest, attended all sessions, and took advantage of the classes to instill some of his own safety-consciousness in his supervisors. These men proved by their actions that "Safety First" was not only a slogan but an actuality at their plants. On the other hand, as top management leaves the scene of training, participation of all other eligible trainees lags and frequency rises. Mr. Walker cites two examples, as follows:

**"At the mines and beneficiation plants** of a Pennsylvania company, 10 2-hr sessions were held in the afternoons and similar ones in the evenings on the same subjects. The general manager not only attended all 20 sessions and took a leading part, but required the assistant manager and three superintendents to attend all 20 sessions. The classes were considered very successful and many recommendations were discussed and adopted during the sessions. . . . It is noteworthy that the accident-frequency rate of this company consistently is one of the lowest in the country among companies with similar operations.

"An example of the opposite attitude is a company whose manager expressed the need for the Bureau's service and his appreciation of the opportunity, and he seemed very enthusiastic. This proved to be lip service only because, when the classes began about 3 wk later, only two men attended—boys just out of school in clerical positions. When questioned as to why, he expressed regrets and said he was just too busy to be bothered with classes just then. The frequency rate at this company is over 200—one of the worst I have found."

Mr. Walker declares that study of data from these 62 plants verifies predictable results, as follows:

1. At a well-protected plant with safety-conscious employees, a frequency rate of less than 2.5 may be expected.

2. Even at a poorly protected plant, if all employees and officials are safety-conscious, frequency rates of from 2.5 to 10 may be attained.

3. At a well-protected plant, if the workers and officials are not very safety-conscious, frequency rates from 10.0 to 20.0 nearly always result.

4. At a poorly protected plant, if safety-consciousness is lacking, frequency rates ranging from 20 to 200 are almost certain.

In concluding his findings, Mr. Walker describes a plant in the South that operated 1,900 days without a lost-time injury, probably a world's record for this type of plant. The average frequency-rate for this type of plant is in the 40's. This is a remarkable record but it falls perfectly into the pattern, Mr. Walker notes. The manager, who is exceptionally safety-conscious, was first employed by the company as safety engineer, and has been constantly "breathing safety down the necks" of all employees as he rose from safety engineer to general manager and vice president. Safety-consciousness is apparent in every man in the plant, therefore a world's record is not surprising.

To join the 1,000-day club, safety-consciousness must be stimulated from the highest-ranking official to the least-skilled worker on the payroll, every day in the year and every hour of the day.

## Mine Bosses Are Lifeguards

FATALITIES per million man-hours of exposure in anthracite mines for January and February, 1951, averaged 0.78, which is 5% better than the rate for the like period in 1950, J. J. Walsh, deputy secretary of mines (Pa.) reports in his circular letter of March 5. In the letter, addressed to all mine inspectors, supervisors and miners, Mr. Walsh continues:

"It is the duty of these officials (mine foremen and assistants) to obey and enforce the law so as to protect the workmen under their care. The effort expended by and the influence of these men in human affairs are essential to the well-being of the mining industry. It is obvious, therefore, that their profession is deserving of full recognition."

Tracing the history of mine-foremanship, Mr. Walsh notes that the present nationwide network of mine supervision is an outgrowth of a Pennsylvania Act of Assembly, dated March 3, 1870, which required the employment of competent mine officials in anthracite mines.

In praising the safety efforts of anthracite mine officials over the years, Mr. Walsh says: "Had the 1870 fatality-rate prevailed in 1950, the picture would have been different. Instead of a loss of 86 lives during the latter year, the total would have been 577."

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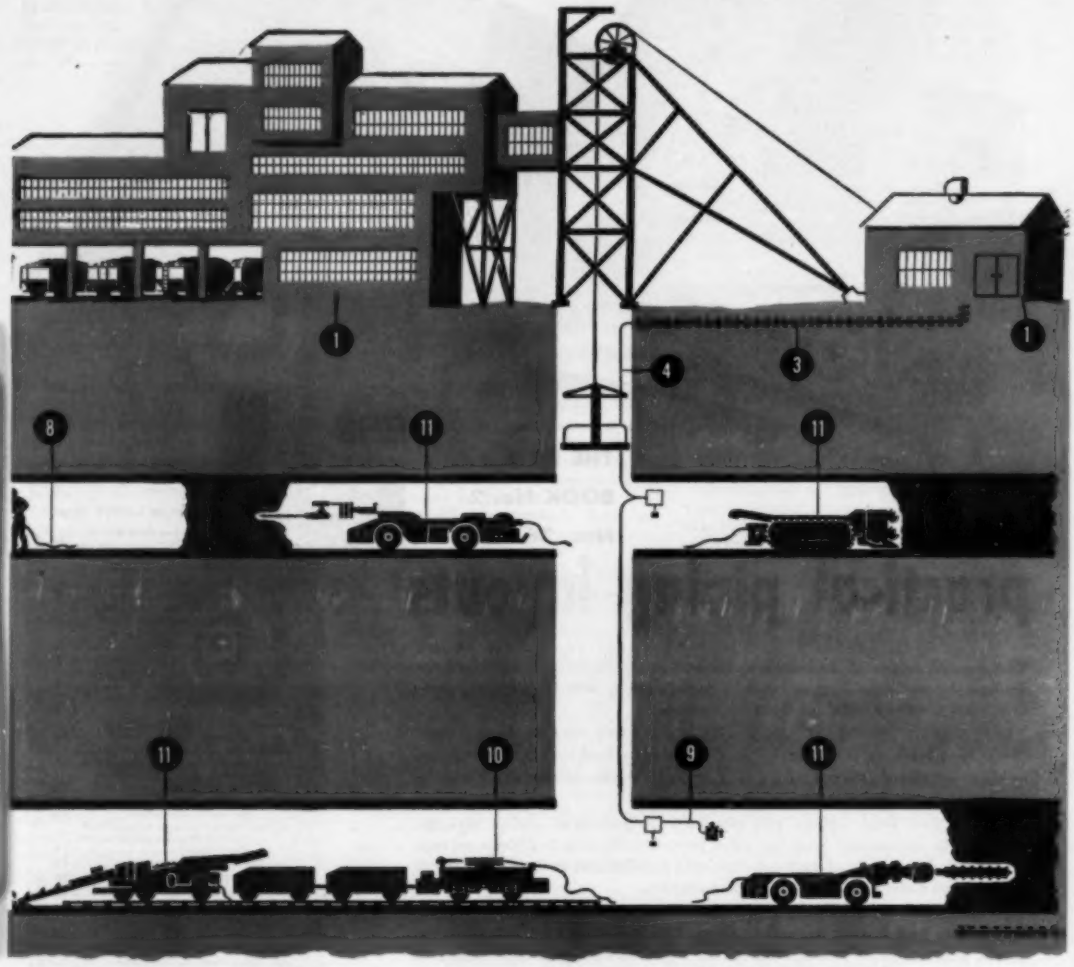


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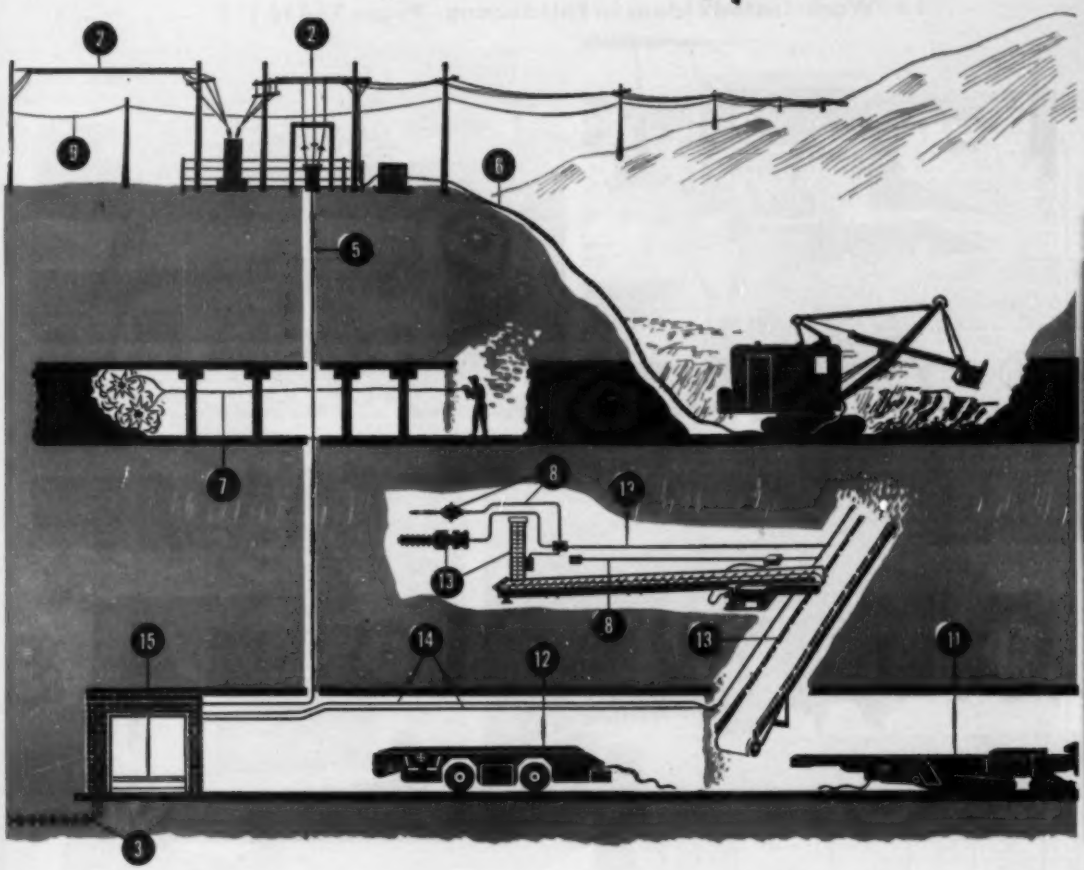


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# Operating Ideas

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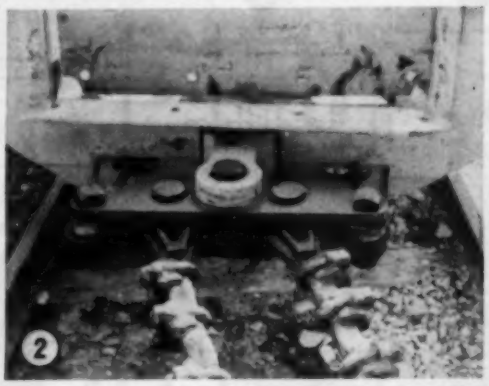
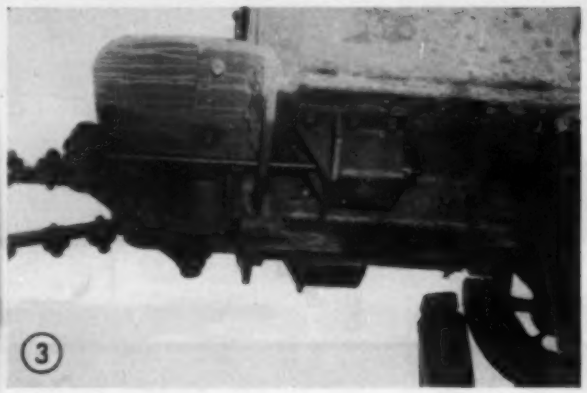
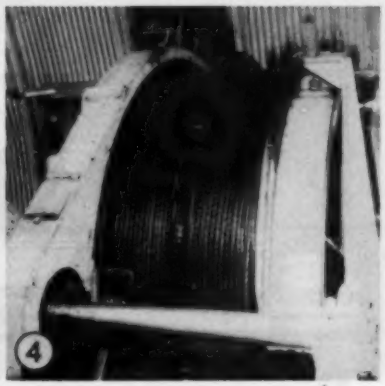


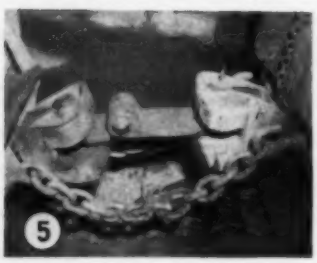




## Double Hoist-Rope on Man-Trip Increases Safety 100%

COMPLETE SAFETY for employees riding the man-trip at No. 3 mine, Bell & Zoller Coal & Mining Co., Zeigler, Ill., is provided by the addition of an extra hoist-rope (1) which practically eliminates the hazard of rope breakage. The two ⅞-in plow-steel ropes are attached to an equalizer (2) on the car, thus insuring that each rope will carry half the load although a single rope of this size has adequate strength for the job. To prevent shock damage to either the ropes or the equalizer, compression springs (3) cushion the tie rods between the car and equalizer.

A steel flange (4), studded and welded onto the center of the drum, separates the drum into two sections, one for each rope. As a further precaution, all cars in the man-trip are connected to each other by a pair of ⅝-in steel chains. A hinged coupling (5) between adjacent cars permits the cars to pass smoothly over the knuckle at the head of the slope.



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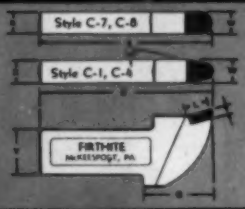
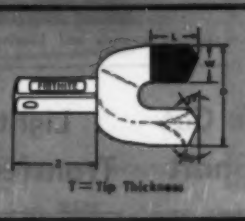



| DIMENSIONS IN INCHES | | | | | | | |
|---|---|---|---|---|---|---|---|
| Style No. | Shank Size | | | | Tip Size | | |
| | G | X | Y | Z | L | W | T |
| C-1-H | 1 ½ | ½ | 1 | 3⅛ | ⅝ | ½ | 9/32 |
| C-4-H | 1¾ | ½ | 1 | 4 | ⅝ | ½ | 9/32 |
| C-1-L | 1 ½ | ½ | 1 | 3⅛ | ⅝ | ½ | 1/8 |
| C-4-L | 1¾ | ½ | 1 | 4 | ⅝ | ½ | 1/8 |
| C-7 | 1¾ | ½ | 1 | 4 | ¾ | ½ | 9/32 |
| C-8 | 1 ½ | ½ | 1 | 3⅛ | ⅛ | ½ | 9/32 |

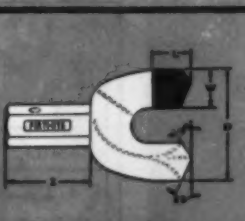
Designed for use on any standard machine using steels having ½"x1" bit holders.

Firthite Auger Drill Bits




| DIMENSIONS IN INCHES | | | | | | |
|---|---|---|---|---|---|---|
| Style No. | D | Shank Size | | Tip Size | | |
| | | Sq | Z | L | W | T |
| D-1 ⅛ | 1 ⅛ | ½ | 1 9/16 | ⅝ | 7/16 | 1/8 |
| D-1 ⅜ | 1 ⅜ | ½ | 1 9/16 | ⅝ | 11/32 | 1/8 |
| D-1 ½ | 1 ½ | ½ | 1 9/16 | ⅝ | 11/32 | 1/8 |
| D-1 ¾ | 1¾ | ½ | 1 9/16 | ⅝ | ⅜ | 1/8 |
| D-1 ⅞ | 1 ⅞ | ½ | 1 9/16 | ¾ | ⅜ | 1/8 |
| D-2 | 2 | ⅝ | 1 9/16 | ¾ | ⅜ | 1/8 |
| D-2 ⅛ | 2 ⅛ | ⅝ | 1 9/16 | ⅞ | ½ | 1/8 |

Firthite Auger Drill Bits




| DIMENSIONS IN INCHES | | | | | |
|---|---|---|---|---|---|
| Style No. | D | Shank Sizes | | Tip Sizes | |
| | | Hex | Z | L | W |
| D-2 1/16-13 | 2 1/16 | 1 3/16 | 2 1/16 | 7/8 | ⅝ |
| D-2 1/2-13 | 2 1/2 | 1 3/16 | 2 1/16 | 1 | 9/16 |
| D-2 9/16-13 | 2 9/16 | 1 3/16 | 2 1/16 | 1 | ⅞ |
| D-2 9/16-16 | 2 9/16 | 1 | 2 1/16 | 1 | ⅞ |
| D-2 5/8-16 | 2 5/8 | 1 | 2 1/16 | 1 | 11/16 |
| D-3 -13 | 3 | 1 3/16 | 2 1/16 | 1 | 1 |
| D-3 -16 | 3 | 1 | 2 1/16 | 1 | 1 |
| D-3 -18 | 3 | 1 1/16 | 3 | 1 | 1 |
| D-3 1/16-18 | 3 1/16 | 1 1/16 | 3 | 1 | 1 1/32 |

For drilling with Ingersoll-Rand Airdox and Cardox Cylinders.

Firthite Roof Drill Bits

T=Tip Thickness

| DIMENSIONS IN INCHES | | | | |
|---|---|---|---|---|
| Style No. | D | Shank Sizes | | T |
| | | Sq | Z | |
| RD-1 1/16L | 1 1/16 | ½ | 1 9/16 | 1/8 |
| RD-1 1/16H | 1 1/16 | ½ | 1 9/16 | 9/32 |
| RD-1 1/4L | 1 1/4 | ½ | 1 9/16 | 1/8 |
| RD-1 1/4H | 1 1/4 | ½ | 1 9/16 | 9/32 |
| RD-1 3/16L | 1 3/16 | ½ | 1 9/16 | 1/8 |
| RD-1 3/16M | 1 3/16 | ½ | 1 9/16 | 9/32 |
| RD-1 ½H | 1 ½ | ½ | 1 9/16 | 9/32 |
| RD-1 ¾H | 1¾ | ½ | 1 9/16 | 9/32 |
| RD-2H | 2 | ⅝ | 1 9/16 | 9/32 |

Recommended equipment for drilling holes for roof bolting, roofing timbers, pin holes, etc. Bits solved for drilling where rock conditions do not require percussion tools.

**Firth Sterling**

STEEL & CARBIDE CORPORATION

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PITTSBURGH 30, PA.

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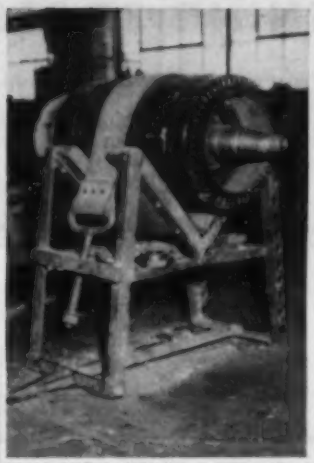
PERSINGERS INCORPORATED
Charleston 27, W. Va.

UNION SUPPLY CO.
Denver 2, Colo.

R-236

# Armature Racks Ease Job of Mounting And Dismounting Be arings in Mine Shop



STEEL RACKS hold large and small armatures for servicing journals and bearings.

WRESTLING WITH ARMATURES, large heavy ones or small skittish ones, is a thing of the past for mechanics at Springdale mine shop, Allegheny Pittsburgh Coal Co., Logan's Ferry, Pa., since the shop force, under the direction of Master Mechanic George N. Truby, built special racks to hold the armatures while bearings and housings are installed or removed.

Major components of the rack are (1) a steel and wood saddle to bear the weight of the armature and stabilize it in working position and (2)a piece of leather belting to strap the armature in the saddle. One end of the belt is looped to receive a bar which is placed through matching holes along vertical members on one side of the frame. The other end of the belt is attached to a bolt for final take-up when the bolt is inserted in a hole in a horizontal member on the other side. This arrangement adapts a single frame to many armature sizes. Springdale uses two racks for its complete line of armatures.

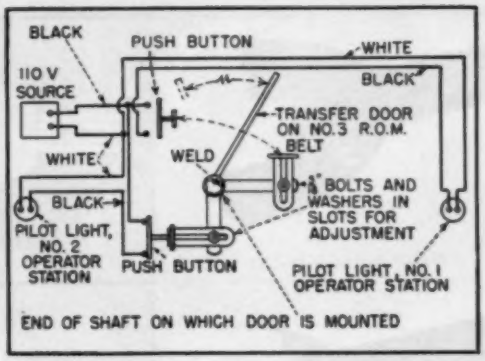
# Hoist-Rope Change Time Cut By Power-Driven Reel Shaft

A POWERED SHAFT on a steel frame is a boon to shaft men at Maryland No. 2 shaft, Berwind-White Coal Mining Co., Wilmore, Pa., when it becomes necessary to change hoisting ropes. Designed by Norman Lehman, master mechanic, the shaft supports and turns a rope reel from power supplied through a chain drive by a 12½-hp motor on a salvaged car hoist. For this application the drum of the hoist was removed and a sprocket for the chain drive was fixed to the end of the drum shaft.

In use, the frame is set in line with the rope port in the engine house. The main shaft of the frame is removed from its split bearings, inserted in an empty reel, then reel and shaft are replaced in the frame. The hoist rope, which has been gathered on the main-hoist drum, is wound onto the reel by the car-hoist motor on the frame. The reel of old rope is replaced by a reel of new rope, then the hoisting engine provides power to wind the new rope onto the main hoist drum.

Heretofore, the better part of a day was required to change a rope, but now 2½ hr are sufficient, exclusive of the time required to cut the rope and attach the basket at the cage end.

# Lights Show Position of Transfer Door in Belt Hopper

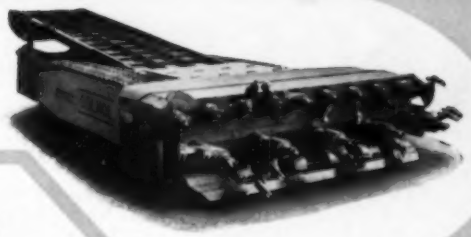



ADJUSTABLE PADS on operating arms rotate with belt-hopper transfer door to operate pilot-light push buttons.

RUN-OF-MINE COAL from No. 3 mine, Powellton Coal Co., Garnette, W. Va., is directed to either No. 1 or No. 2 tipple by a transfer door in the discharge hopper at the end of the main belt, James T. Sauls, Man, W. Va., writes, in explaining a pilot-light system which shows tipple operators at a glance the position of the transfer door. The lights are controlled by rotation of the shaft on which the door is mounted, the shaft having auxiliary arms that close either of two momentary-contact-type push buttons to close either of the pilot-light circuits. The arms are welded to the end of the door shaft and are fitted with adjustable pads to operate the push buttons. Pieces of scrap steel of proper size and shape for this particular application serve as operating arms.

## "COLMOL" CONTINUOUS MINING MACHINE

Various models for mining and loading from 3 to 5 tons per minute without the use of explosives. Mines an entire room 9'6" wide, with varying heights—advancing at the rate of 24" per minute or more. Two models will be displayed—don't miss them.



## DRILLING MACHINES

Types 56-FHR or RDR for off-track mining. Can be equipped with arms for horizontal or roof drilling.

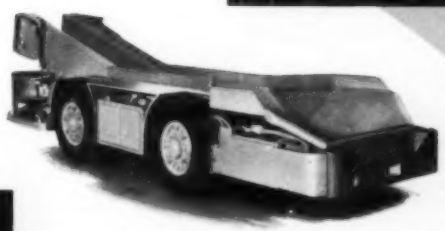
# JEFFREY SHOWS ADVANCED MINING EQUIPMENT DURING COAL SHOW

## SHORTWALL TRUCK

For transporting any type of SHORTWALL cutter. Tilting pan facilitates loading and unloading machine. Can be used also for transporting supplies.

## 70-UR UNIVERSAL CUTTER

Cuts any place in the seam, including shearing. Completely hydraulic in operation. Furnished in 30" and 34½" heights, with single or dual drive wheels. You'll like the flexibility of the 70-UR—see it in action.



## SHUTTLE CARS

Cable reel types with varying heights. Two wheel drive with two wheel steering, or four wheel drive with four wheel steering. All sizes with elevating discharge. Operator's deck either left or right side.

# SEE JEFFREY FIRST

## BOOTHS 2543-2655

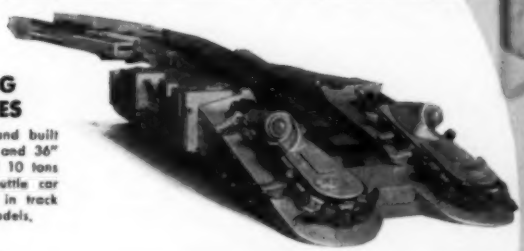
• Under present conditions the Coal Operator is obliged to mechanize, of necessity, if he is to compete favorably in today's and future markets.

To help produce better coal—faster—and at lower cost, Jeffrey offers a complete line of modern mining machinery. Many of these units will be on display during the Show. Stop in and become conversant with the numerous advantages they provide. Consult a Jeffrey Engineer for suggestions as to how this equipment may be best applied to your operation.

Ample literature covering each of the units will be available.

## LOADING MACHINES

Crawler mounted and built in heights of 28" and 36" with a capacity of 10 tons per minute for shuttle car loading. Available in track and rubber tired models.



## 72-AR ELEVATING CONVEYOR

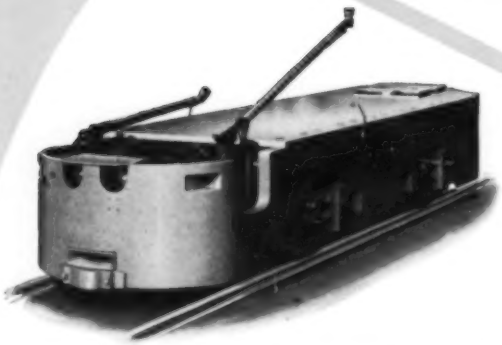
For use with shuttle cars or conveyors. Discharge height is adjustable to suit car height. Can also be furnished with steel flanged wheels for riding rails or with implement type wheels.

# JEFFREY Equipment for

## FOR TRACK MINES

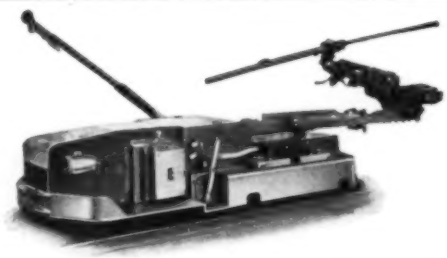
### UNIVERSAL CUTTERS

Hydraulically operated and track mounted, the Jeffrey 29-U Universal cutter cuts anyplace in the seam—top, bottom, center and shearing. Only 33½" high above rails.



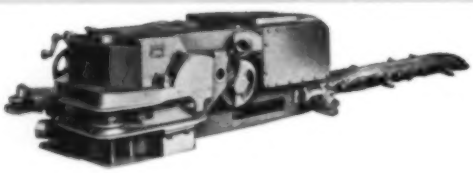
### ELECTRIC LOCOMOTIVES

Built in a wide variety of types and sizes, for either trolley or storage battery operation. Feature round end, "armor plate" steel frames, anti-friction journal boxes and motor axle suspension; handwheel, air, dynamic or hydraulic brakes.



### DRILLING MACHINES

Types 56-A, 56 FH and 56 RD for track operation. Can be furnished with mechanically or hydraulically operated arms for horizontal drilling and hydraulically-operated arm for roof drilling and bolting.



### SHORTWALL CUTTERS

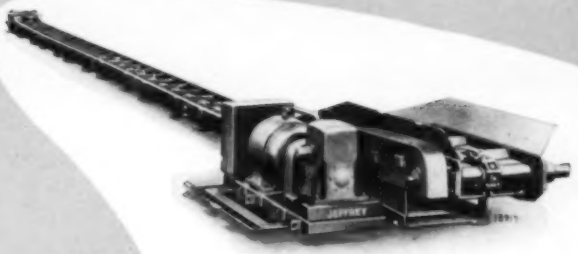
Series 35 in various types with either 35 or 50 H.P. motors for conveyor mining or equipped with trucks.

### HIGH CAPACITY LOADING MACHINES

Track mounted, hydraulically controlled units for high capacity loading. Two types: L-500 for the low vein seams and the L-600 for mines permitting the use of higher units.

# Modern Coal Mine Operation

## UNDERGROUND CONVEYORS (Sectional Types)

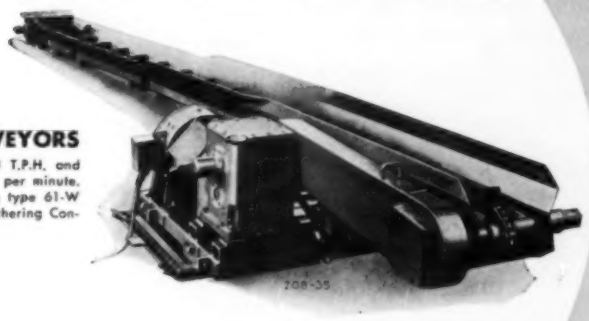


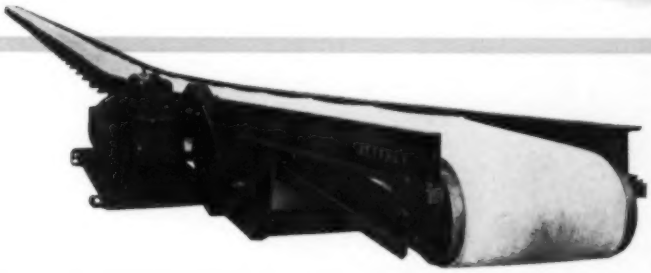
### FACE CONVEYORS

These conveyors are built to take the excessive abuse at the face. Type 61-HG shown has maximum length of 90 feet with a capacity of one ton per minute. Also type 61-AF face conveyor for lighter work but interchangeable with the 61-AM.

### ROOM AND GATHERING CONVEYORS

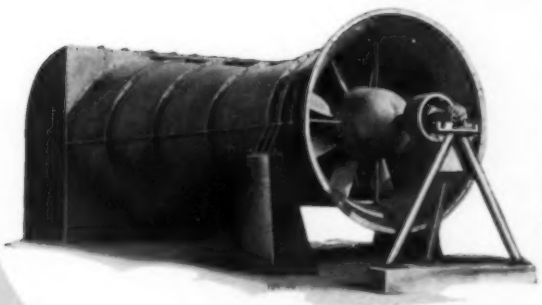
Various types with capacities from 1 to 3 T.P.H. and standard chain speeds from 90 to 140 feet per minute. Type 61-AM Room conveyor is shown. Also type 61-W room or gathering conveyor and 61-WH Gathering Conveyor as well as Elevating Conveyors.





### GATHERING OR HAULAGE CONVEYORS

Sectional Belt Conveyors are used where coal must be transported over long distances beyond limitation of chain conveyors. In three widths for belts 26", 30" and 36" wide—have been operated in lengths exceeding 3,000 feet on the level. Large capacities.



### FANS AND BLOWERS

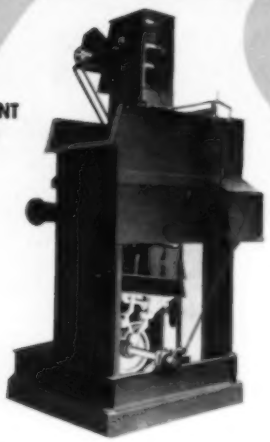
Jeffrey "AERODYNE" mine fans provide the highest efficiency in ventilation, insuring an abundant supply of fresh air when and where needed most. A range of sizes to meet capacity requirements up to 500,000 C. F. M. Portable Blowers also available for blowing fresh air to dead ends through flexible tubing. "AERODYNE" midget type shown at the right.

# JEFFREY

## *Serves the Coal Industry*

## COAL PREPARATION EQUIPMENT

JEFFREY ONE COMPARTMENT DIAGRAM JIG



### PREPARATION EQUIPMENT

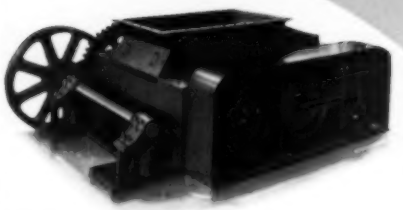
Jeffrey one compartment Diaphragm JIG with 25 sq. ft. of screen area.

Jeffrey Baum and Diaphragm Jigs represent the most effective high capacity mechanical coal cleaning units on the market today. Proved design—carefully designed—no pre-sizing necessary. Single or multiple compartments.

Air-operated Baum Jigs—for capacities up to 700 T. P. H.

Diaphragm Jigs—for capacities up to 300 T. P. H.

Also Unit Washers for washing up to 300 T. P. H. These units combine a Diaphragm Jig with a self-contained dewatering and sizing screen, and water clarifying tank.

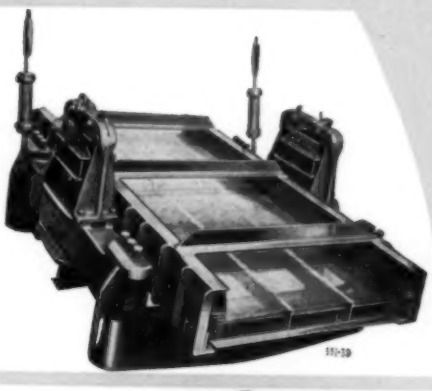


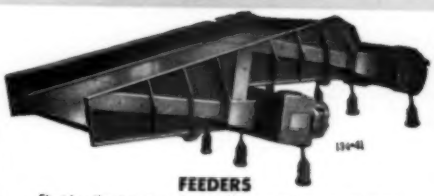
### CRUSHERS

Heavy duty Double Roll machines for large capacities. Adjustable to provide a product range from 4" to 12". Crush anything that comes from mine face—capacities up to 1500 T. P. H. depending upon size of product. Large size—30" x 36" — double roll Crusher shown.

### SCREENS

Single or multiple deck electric vibrating Screens for any screening requirement. Also "CONVEY-ANSCREENS," Feeders, Bin Check Valves, etc.





### FEEDERS

Electric vibrating types for providing absolute control over tonnage handled in feeding operations. Used for feeding crushers, belts, jigs, etc. Also mechanical feeders and conveyors.

### BELT IDLERS

Roller or ball bearing troughing and Return Idlers for belts from 14" to 60" wide. Jeffrey Belt Conveyors are being widely used in both coal and metal mining operations.

### APRON CONVEYORS

Jeffrey steel apron Conveyors are used for conveying, feeding, and for picking table and loading boom service. For large carrying capacity the steel apron conveyor is in a class by itself. Also bucket elevators, feeders, and spiral conveyors.

# THE JEFFREY MANUFACTURING COMPANY

*Established 1877*

*General and Export Sales Offices*

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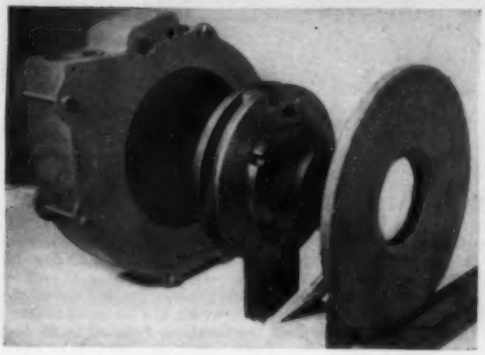
THE KILBOURNE & JACOBS MFG. CO., Columbus, Ohio

Most of this Jeffrey equipment is patented or patents have been applied for.

# Four Operating Briefs From Other Industries

We've pared these "Operating Briefs" to the bare essentials so that you need only a minute or two to check their application possibilities. These ideas cut costs and saved time at a zinc mine, an iron mine, a steel plant and a bus shop. Perhaps you can use them as is, or perhaps they'll suggest other solutions to similar problems.

## Pump Parts Last 10 Times Longer With Silicon-Carbide Coating



COAL-HANDLING SLURRY PUMPS might well offer unusual application possibilities for a new silicon-carbide ceramic material successfully applied to pumps at the zinc mine of the St. Joseph Lead Co., Balmat, N. Y., where the ore handled is highly abrasive. The metal pump housing lined with silicon-carbide shown at the left had been in use 520 operating days when these data were released and was still in service, compared with a total of 61 days for an all-metal housing. Other pump parts coated with the material had so far given up to 10 times the service of metal parts and over twice that of rubber-lined parts. The company had previously tried various alloys, but had obtained the best results from rubber-covered parts until the special ceramic material that would bond small particles of silicon carbide was developed by the Norton Co., Worcester 6, Mass. While it is yet to be tested on coal-mine pumps, complete data may be had from the Norton Co.

## Overhung Driving Pulley Reduces Costs for Conveyor Installation and Maintenance

FOR USE ON HEAVY BELT CONVEYORS, this new conveyor drive developed by the National Iron Co., Duluth, Minn., accomplished a net saving of $8,000 in installation cost alone. Believed to be the first of its kind in such use, the new drive installed on the Iron Range utilizes an overhung driving pulley and thus eliminates the conventional head shaft and its bearings, as well as the low-speed coupling or chain drive, with a considerable reduction in maintenance costs anticipated. The drive uses a special speed reducer built by the Westinghouse Electric Corp., which is equipped with an extra-large gear shaft and special antifriction bearings to provide the added capacity necessary for overhanging the driving pulley. Taper-hardened gearing and pinion shafts, together with fabricated steel housings permit a unit of minimum size.

## Five Air Hoses Connect to One Line Through Shop-Built Extension

IF YOU HAVE OCCASION to connect several hoses to one air line, either on the surface or underground, this homemade extension with multiple outlets used by the Twin Coach Co., Buffalo, might be successfully adapted to your needs. The connector is a piece of 2-in pipe about 2½-ft long, with a snap coupling on one end for attaching the lead air line. Two short pieces of angle welded to the pipe serve as a base, and along the top are short ½-in pipe connections, elbows and snap couplings for air hoses. This extension handles five air lines at a time.

## One Man Operates Crane "Ice Tongs" To Lift 15 Tons of Steel Safely

THESE "ICE TONGS" handling 30,000-lb loads of steel rounds from 4 to 13 in in diameter at the Lorain, Ohio, plant of the National Tube Co. might possibly simplify the job of handling large quantities of timber, steel or other heavy material in a mine supply yard. Only one craneman is needed since the tongs have an automatic locking device. With only one man doing the whole job, it is safer as well as being less costly. The tongs are made by the Heppenstall Co., Pittsburgh, Pa.

AIR-COOLING ICE is stacked about 25 ft inby the portal of the intake slope by Roy Strike (left), Loren Turnage and Harold Cully.

WATER SPRAYS form a cooling curtain through which air passes to the underground workings. Cool air carries less moisture.

## How Peabody Coal Co. Conditions Air for Better Roof Control

SINCE ROOF FALLS may be caused by the action of warm air on cool rock surfaces underground, ventilating air at Mine No. 40, Peabody Coal Co., Corinth, Ill., is cooled as it enters the intake slope to prevent condensation and to improve working conditions.

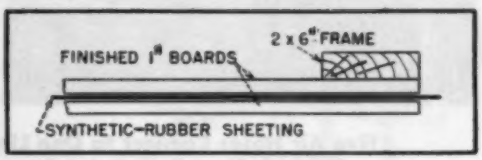
Water sprays, 50 ft inby the portal, cause a temperature drop of from 5 to 10 deg. On high-humidity days, however, the water sprays alone are not effective, but a rack of ice, 25 ft inby the portal, causes an air-temperature-drop of from 8 to 12 deg. By the time air passes these cooling agents and reaches the bottom of the slope it is within the range of average mine temperature, from 66 to 68 deg.

## Spare Supply-Yard Locomotive Built From Salvaged Parts

A USEFUL LOCOMOTIVE for service in the supply yard at Maryland No. 2 shaft, Berwind-White Coal Mining Co., Wilmore, Pa., combining the running gear of a 5-ton locomotive with a power train from three scrapped automobiles, was built by Norman Lehman, master mechanic, and his mechanics and welders at the mine shop. Supplementing a diesel-powered locomotive in tramming supply cars, the shop-made locomotive consists of a Chevrolet engine and transmission, a Buick transmission and a GMC heavy-duty differential driving wheels and axles from an old 5-ton mine locomotive.

The Chevrolet engine and transmission are used in the conventional manner but the Buick transmission, which follows the Chevrolet transmission in the power train, is in the reverse position. This assembly provides a selection of speeds and power ratios for either direction of travel. To move forward, the Buick transmission is set in reverse gear and speed is selected in the Chevrolet transmission. In moving in the opposite direction the Chevrolet transmission is set in reverse gear and the desired speed is selected in the Buick transmission.

The axles of the GMC differential-assembly were shortened and provided with sprockets to permit chain-drive locomotion. The parking brake lever controls brake shoes that operate against the locomotive wheels.

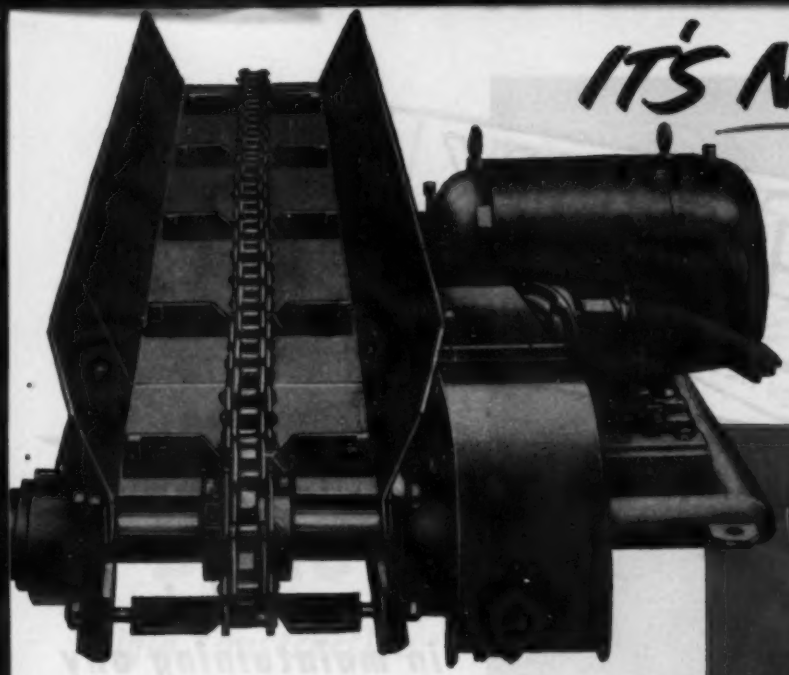



## Effective Gas-Tight Seals Made of Synthetic Sheeting

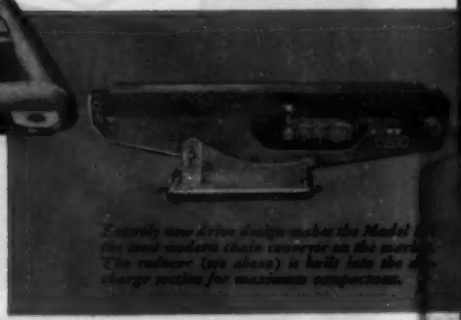
SPEED OF APPLICATION and use of the least bulky materials possible are both highly important in fighting mine fires and in recovery work. Synthetic-rubber sheeting answered those qualifications in making seals and air locks gas tight in the Rosita No. 6 coal mine, in the state of Coahuila, Mexico, where a fire zone was sealed off and then opened about 6 mo later.

A paper presented before the 1950 meeting of the Kentucky Mining Institute by Karl Marshall, company director of safety, offer this installation data: "Air locks and seals were built on 2x6-in frames and made of a double layer of finished 1-in boards with a layer of synthetic-rubber sheeting between boards. All edges of the boards were driven against rolled canvas and a filler of cement mortar trowled around sides and roof contacts and a cement sill was poured across the floor."

Rosita No. 6 is operated by Cia. Carbonifera de Sabinas, S.A., a subsidiary of the American Smelting & Refining Co.



# IT'S NEW! and a LEADER



Entirely new drive design makes the Model FA the most modern chain conveyor on the market. The reducer (see above) is built into the discharge section for maximum compactness.

# JOY 1951 MODEL FA CHAIN CONVEYOR

**THE SIMPLEST, LIGHTEST, MOST COMPACT and EFFICIENT DESIGN IN THE FIELD . . . 12", 15" and 20" SIZES**

## Exclusive Features!

- ★V-Belt drive, unaffected by misalignment, eliminates flexible coupling.
- ★Helical and spur reducer—more efficient than worm reducers.
- ★Ball-bearing mounted shear-pin sprocket—eliminates wear after shear.

**LONGER SERVICE with LESS MAINTENANCE**

## Advantages You'll Like!

- ★Compared to conventional drives, the new Model FA is 500 lbs. lighter and requires 4 sq. ft. less area.
- ★Has non-jamming gravity take-up and drop-forged steel flights—flight integral with the link.
- ★Available with open or closed-end tail sections. Three chains available: 19,000 to 27,000 lbs. ultimate strength.

*Consult a Joy Engineer*

W&D CL 5347

# JOY MANUFACTURING COMPANY

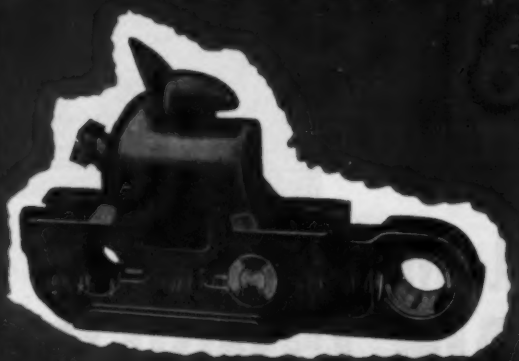
GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# PROX

ON THE BANKS OF THE WABASH — SINCE 1873

## CUTTING CHAIN AND BITS



***Help for you in maintaining any production pace without costly breakdowns and replacements--***

Here is that smooth running Prox Cutting Chain that requires less power yet is doing that all important job of cutting costs and speeding production for many operations.

The bit is held by one moving part and rivets are eliminated thru the use of a strapless chain. One of the features of this chain is in design that permits replacement of parts in a matter of minutes.

This chain was designed and engineered as a result of years of contact with cutting machines and chain problems. The net result to you is the very finest in efficiency with modern cutting machines.

The Prox Tool Steel Bits are known for their ability to stand up under heavy abuse. Each of these Tool Steel points cuts at least as much as a hard tipped ordinary mine bit.

FRANK **PROX** COMPANY, INC.

PROX

ON THE BANKS OF THE WABASH — SINCE 1875

# CUTTER BARS

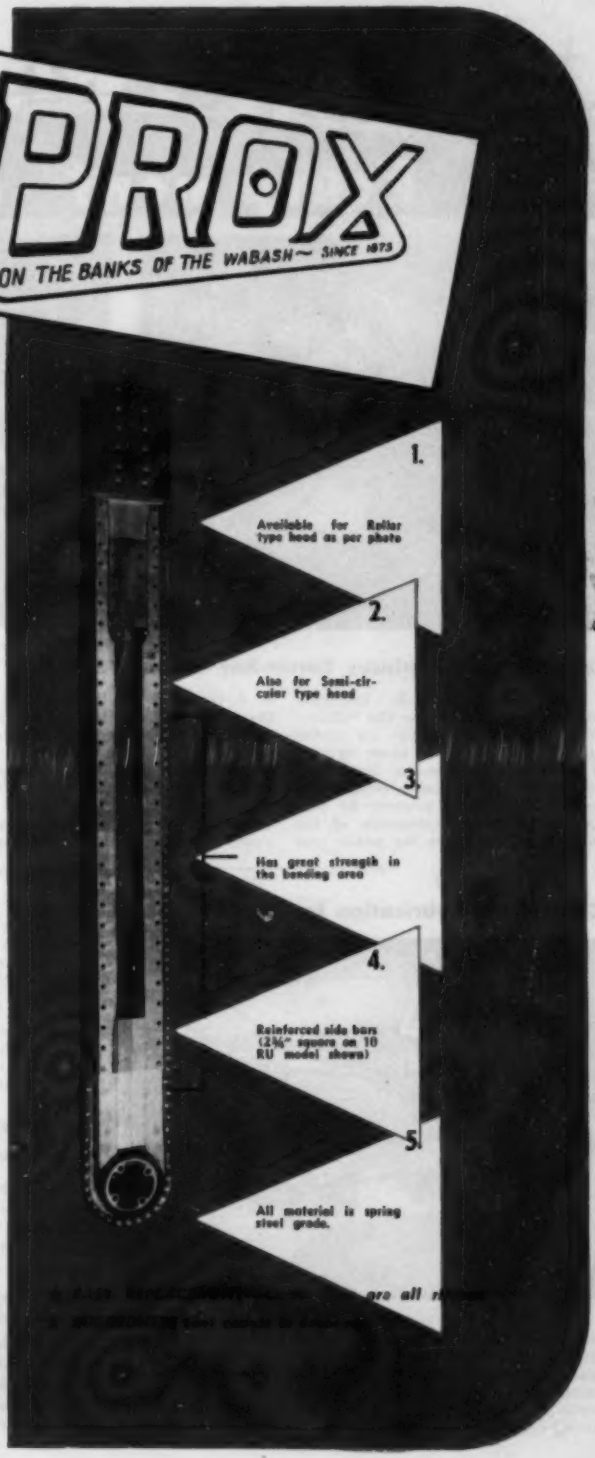
## *Rigid Construction for Long Life*

Points 3, 4 and 5 give you an idea of the durability that is built into Prox Cutter Bars. Here is construction that you can depend upon for the kind of service that results in exceptionally low cost performance. You get years of trouble-free service because these cutter bars can take it without bending or breaking.

PROX Cutter Bars are tested products having served efficiently, in the past years, under varying conditions.

These Cutter Bars are furnished for using three types of cutter heads. The Prox Roller Cutter Head, the Prox Semi-Circle Cutter Head, and the Prox Semi-Circle Shoe Type Cutter Head. The Bars are furnished equipped with water upon request for a slight additional cost.

Investigate PROX products—see why they give you the kind of service demanded by modern production. Let's talk it over.


1.
Available for Roller type head as per photo
2.
Also for Semi-circular type head
3.
Has great strength in the bending area
4.
Reinforced side bars (2½" square on 10 RU model shown)
5.
All material is spring steel grade.

TERRE HAUTE, INDIANA

# Equipment News

## Portable Unit Replaces Cutter-Bar Rivet in 3 Sec (1)

New Manco portable hydraulic rivet squeezer, known as the "Guillotine," for riveting liners on cutter bars of coal-cutting machines consists of a 38-lb rivet-squeezer head connected by high-pressure hoses to a semi-portable pump powered by a 2-hp electric motor. Operation of the valve handle actuates the power ram to deliver a 60,000-lb thrust against the rivet head, with the ram automatically retracting on release of the valve. The rivet is squeezed flush so that no finish grinding is required and the operation takes only 3 sec per rivet, the maker says. The unit also is available with a hand-operated pump that is completely portable and can be used for replacing rivets on cutting machines underground. The basic Guillotine unit, with a modification of the "C" frame head and a cutting head substituted in the place of the ram, has been successfully used to cut steel rod and now is being adapted to trimming the ends of roof bolts flush to the nut where headroom is a factor, the manufacturer reports.—*Manco Mfg. Co., Bradley, Ill.*

## Centralized Lubrication for Hydraulically Operated Mining Machinery (2)

New improved Hydra-Luber centralized lubrication system designed for application to all mining machinery utilizing a hydraulic-pressure system for controlling and operating various machine movements is shown above as installed on a modern mobile coal loader to provide automatic positive lubrication to 68 bearings. Rigid or flexible tubing connects each bearing to a lubricant injector which is externally adjustable to injust the correct quantity of oil or grease required. The circuit injector manifolds is connected by flexible hose to the main supply line terminating at the Hydra-Luber pump, which has a pressure ratio of 5¾:1. The Hydra-Luber, supplied with lubricant from an independent reservoir, also is connected by flexible tubing to the hydraulic valve controlling machine movement. Bulletin 670 offers full details.—*Lincoln Engineering Co., St. Louis 2, Mo.*

### Here's Help if You're Interested In New Machinery and Equipment

IF YOU'RE GOING to the Cleveland Coal Show, check over the preview of the manufacturers' exhibits on pp 86-93 of this issue of COAL AGE. It's specially arranged to save you time in spotting the equipment and supplies you can put to good use.

BE SURE TO WATCH JUNE COAL AGE for the Post-Convention Report—a complete review of the Coal Show, including digests of the papers presented and details of equipment shown.

AND EVERY MONTH, make it a point to use the postage-free card to request catalogs and other data on the products described in this section. Glancing over these pages may lead you to the solution of a knotty operating problem that would repay you many times over for the few minutes you spend.

# Quality Plus

## ...IT'S THERE IN EVERY KENNAMETAL TOOL

Refining Ores

Forming Carbide Shapes

Research and Design

For a tool to have extra quality, many things about it have to be different, as they are with a Kennametal tool. The technical skill of powder metallurgists, engineers, designers, development men, and even the field representatives are interwoven into the fabric of making Kennametal better and more efficient. Each contributes greatly to its high quality. This starts when research takes the ore oxides and purifies them to the highest degree in our Kingston plant. From there through the special sintering stages, the powders are processed under precise controls, and finally hard, tough cutting materials are produced that are true to grade and free from flaw. The engineer, designer, and development men utilize these small, almost diamond hard, inserts to make highly efficient production tools. Then, in the field, a staff of sales representatives, experienced in coal mining, assure you of its proper use. You can depend on Kennametal's high quality to help you meet today's higher production demands. Kennametal Inc., Latrobe, Pa.

**KENNAMETAL®**

DRILL BITS • MACHINE BITS • ROCK BITS • ROOF BITS

Tool Fabrication

Field Application

*Bits for Every Cutting & Drilling Need*

# STAYS RIGHT ON THE JOB!

With the COMPLETE Victaulic System you just can't go wrong. Even on the toughest piping jobs VICTAULIC Couplings, Victaulic Full-Flow Elbows, Tees and other Fittings make joining those pipe ends quick, easy, and economical. Victaulic assures complete flexibility and long-lasting dependability in piping construction.

When you join 'em up with "Vic" you save every way – a simple two-bolt design gives quick, easy hook-ups; a speed or T-wrench is the only tool needed for connections ... AND Victaulic joints prevent costly blow-offs and pull-outs ... stay positive locked even under extreme pressure, vacuum or strain conditions. Yes sir, with Victaulic those pipe sections and fittings will stay right on the job.

It's a cinch to groove pipe ends the Victaulic Way ... "Vic-Groover" grooves 'em automatically, twice as fast as a conventional pipe threader!

Save time, work, and money! Use the COMPLETE Victaulic Line ... it's THE EASIEST WAY TO MAKE ENDS MEET.

***JOIN UP WITH "VIC"—make your next piping job ALL VICTAULIC—Write today for Victaulic Catalog and Engineering Manual No. 44-8A.***

**NOTE VIC'S NEW COMBINED MAIN OFFICE AND PLANT ADDRESS BELOW—**

**VICTAULIC COMPANY OF AMERICA**
**1100 Morris Avenue, Union, N. J.**
Mailing Address: Box 509, Elizabeth, N. J.
Phone: Elizabeth 2-3640
Victaulic Inc., 727 W. 7th St., Los Angeles 14, Calif.
Victaulic Company of Canada, Ltd., 406 Hopewell Ave., Toronto 10
For Export outside U.S. & Canada: PIPECO Couplings & Fittings, Pipe Couplings, Inc., 30 Rockefeller Plaza, New York 20, N.Y.

**27TH VICTAULIC YEAR**

The easiest way to make ends meet
**VICTAULIC**
PIPE COUPLINGS AND FITTINGS

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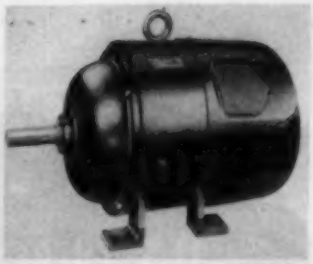
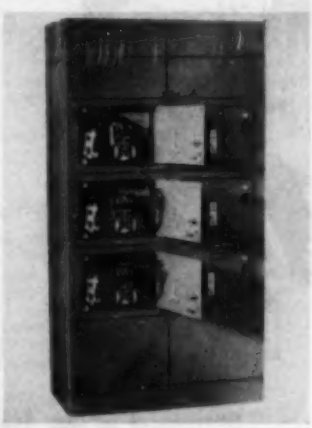


## Explosion-Proof Motors Need Less Attention (3)

New totally-enclosed non-ventilated or fan-cooled, explosion-proof DC Life-Line motors, for low- and medium-voltage applications, are available in sizes from ½ to 20 hp, and speed ranges of from 850 to 3,500 rpm, with series, shunt or compound windings, as required. Packing glands around power-cable port, rotating flame-seals at each bearing, long rabbet fit between frame and brackets, and screw-type brass access covers assure explosion-proof construction, the manufacturer states. One-piece rolled-steel frame, lifetime-lubricated ball bearings and thermosetting varnish on windings reduce maintenance and increase moisture-resistance, it is said.—*Westinghouse Electric Corp., Pittsburgh 30, Pa.*



## Prefab Units Control Separate Motors (4)

Multitrol, for any control system up to 600 v, consists of prefabricated units, each controlling a single motor, assembled and wired into steel control centers available in two sizes, 90x20x20 in or 76x20x20 in. Built to AIEE and NEMA standards, Multitrol has reversing or non-reversing magnetic full-voltage starters, multi-speed starters, primary or secondary resistance starters or autotransformer starters. Standard models are

# EATON

## *2-Speed Truck*

# AXLES

## Lower "Per Mile" Costs

Maintenance expense, a major item in truck operating costs, is much lower when trucks are equipped with Eaton 2-Speed Axles.

Eaton Axles provide twice the conventional number of gear ratios . . . permit the driver to select the one best suited to specific operating conditions, with minimum strain on engine and power transmitting parts. Wear and breakages are reduced; repairs are needed less frequently, and trucks stay on the job.

Eaton Axles have many exclusive features to assure top axle performance for the life of the truck: planetary gears distribute loads over several gear teeth, dividing the stress; positive lubrication, even at slow speeds, reduces friction wear. For complete information, see your truck dealer.

*Axle Division*

**EATON MANUFACTURING COMPANY**

CLEVELAND, OHIO

PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

NEW EFFICIENT MINE STOPPING METHOD
USES AMAZING G. E. SPRAYABLE PLASTIC FILM

# COCOON®

You've heard about our original COCOON—it's the tough, waterproof, acid-proof sprayable plastic that has been used by the Army and Navy to "wrap up" everything from B-29's to battleships.

Now a special version of COCOON—G. E. COCOON, is proving highly useful in mine stopping applications, providing a flexible, continuous seal which can be applied quickly, without special skills. Get the whole COCOON story—write today for details.

## HERE'S HOW G. E. COCOON IS USED

- For Temporary Stoppings on Brattice Cloth
- For Dry Walls of Concrete Block
- For Repairs of Cracked Concrete Walls or Broken Overcasts
- For Roof and Ribs to Prevent Spalling

## AND HERE ARE SOME OF THE *BIG* ADVANTAGES OF G. E. COCOON

1. More effective sealing makes ventilating systems more efficient—cuts operating costs of fans and pumps.
2. Saves money by facilitating recovery of stopping materials (G. E. COCOON can be reused many times).
3. Is absolutely non-toxic—can be sprayed in confined areas without masks using standard pressure spraying equipment.
4. Acid and moisture-proof; will not mildew or rot.
5. Recommended spraying equipment includes 2-wheel, mobile air compressor. Weight 275 lbs.—L. 26", W. 17", H. 24".

COCOON

Whiz

COCOON ENGINEERING DIVISION
**R. M. HOLLINGSHEAD CORP.**
**Camden 2, New Jersey**
*LEADER IN MAINTENANCE CHEMICALS*
Canadian Offices: Toronto
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### See It for Yourself!

Let our engineers recommend a G. E. COCOON application to meet your specific problem. Demonstrations and training courses for your men can be arranged at our Camden offices and, in many instances, at your own mines. Write for information.

# tailor-made

## . . . to fit every diesel power requirement

# Ashland special DIESEL fuels

Fitting petroleum products to the job is one of Ashland's greatest accomplishments. Modern refinery methods, applied to a selected supply of fine crudes, allow us to offer a complete range of diesel fuels that meet all the requirements of various types of engines as well as specific operating applications and conditions.

Ashland recognizes that intelligent selection of fuel for any specific engine and application is exceedingly vital. Care in this selection and adherence to one uniform quality will pay off in better engine performance, increased fuel efficiency and less maintenance. Ashland's laboratory checks throughout the refining processes carefully guard this uniformity and assure you continuous, efficient operation.

Ashland's engineers will gladly consult with you and help you select the type of fuel best suited to your specific requirements. One trial will quickly convince you that it pays to use Ashland tailored diesel fuels.

## Special DIESEL LUBRICANTS

ASHLAND and VALVOLINE diesel oils and special heavy-duty lubricants are known throughout the industry for the fine job they are doing, protecting equipment and maintaining it at top efficiency.

Our complete line includes heavy-duty, detergent oils, special engineered oils for railroad and other high-power output applications, as well as lubricants for construction and truck equipment. Write for complete information.

ASHLAND OIL & REFINING COMPANY

ASHLAND, KENTUCKY

SUPPLY TERMINALS: Ashland, Ky. — Buffalo, N. Y. — Cincinnati, O. — Cleveland, O. — Cleveland, O. — Erie, Pa. — Evansville, Ind. — Findlay, O. — Huntington, W. Va. — Jackson, Mich. — Kansas City, Mo. — Louisville, Ky. — Minneapolis, Minn. — Parkersburg, W. Va. — Pittsburgh, Pa. — Portsmouth, O. — Toledo, O. — Tulsa, Okla. — Zanesville, O. — Pittsburgh, Pa. — Pittsburgh, Pa. — Milwaukee, Wis. — St. Louis, Mo. — Detroit, Mich.

Stearns

ELECTRO-MAGNETIC PULLEY
PROTECTS REDUCTION CRUSHERS
"pays for itself over and over"

HANDLING limestone for a large mid-western producer, this STEARNS Electro-Magnetic Pulley protects the reduction crushers by removing all tramp iron automatically, economically. If you want to reduce shut-down time and keep repair charges to a minimum — install a STEARNS Magnetic Pulley. It's the only economical and effective insurance against the tramp iron nuisance.

Whether your problem is the fairly simple job of tramp iron removal or the concentration and beneficiation of complex ores, STEARNS has EXPERIENCE ENGINEERED equipment to meet your specifications.

For a thorough investigation of your separation problem, STEARNS offers complete laboratory research facilities. Write today for details on testing of sample material.

ALL SIZES, ALL TYPES TO FIT YOUR NEEDS

Years of research and development by STEARNS engineers have produced an outstanding product in magnetic pulleys — the reason for the wide acceptance in all industries for removing tramp iron, for separation and reclamation of materials. For complete specifications and operating data, write for literature.

STEARNS Permanent Magnetic Pulley

Stearns
ELECTRO AND PERMANENT MAGNETIC PULLEYS

STEARNS Electro-Magnetic Pulley

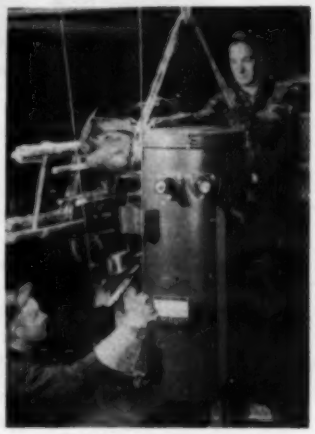
Stearns MAGNETIC MANUFACTURING CO.

661 S. 28th St., Milwaukee 46, Wis.

equipped with externally-operated circuit breakers and thermal-overload and low-voltage protection, and any number of motors can be independently or interdependently controlled from a central station. Bulletin 4110.—*Ward Leonard Electric Co., Mt. Vernon, N. Y.*

## Wagon Drill Operates In Many Positions (5)

New Model FM-3 wagon drill, with Type X-71-WD drill, features a tricycle-mounted yoke that can be raised or lowered for horizontal toe holes or higher holes by a rachet-actuated worm-and-pinion hoist mechanism. For drilling vertical line holes near a highwall or quarry face, the swivel-mounted front wheels can be toed-in 90 deg, thus setting the drill ahead of the carriage. Bits up to 4-in gage can be used and the drill is designed to drill to a maximum depth of 24 ft, with 6-ft steel changes. Drill tower and variable-speed feed motor are slide-mounted to further increase flexibility.—*Ingersoll-Rand Co., New York 4, N. Y.*



## Three-Phase Transformers Up to 30% Lighter (6)

Application of Spirakore construction utilizing cold-rolled oriented-grain steel to GE three-phase transformers rated 150 kva and less, 15 kv and below, has permitted production of units with lower exciting current, smaller dimensions and weight reductions as high as 30% in some ratings, the manufacturer reports. While the Spirakore design has been used on single-phase distribution transformers for some years, it has not previously been extended to three-phase cores. The reduced weights and smaller dimensions permit easier handling and less costly poleline and other construction, the company points out. For detailed information, circle No. 6 on postage-free return card.—*General Electric Co., Schenectady 5, N. Y.*

# MOVE MORE COAL PER MAN-HOUR WITH

B'G

# PORTABLE MINE CONVEYORS

MODEL 366

## FOR FAST MOVING, CONTINUOUS MINING OPERATIONS

The new Model 366 ideally meets the need for a portable conveyor that can be positioned manually—and rapidly—to follow continuous mining machines.

As many as fifteen Model 366's can be used in series—each discharging into another—to replace costly "permanent" equipment in a wide range of applications.

## THE FIRST SUCCESSFUL PORTABLE UNDERGROUND CONVEYORS

**20 FEET LONG: 24" BELT WIDTH**

**EASY TO MOVE:** light weight, good balance, pneumatic tires.

**LOW HEIGHT:** only 34" at point of discharge.

**LOW HORSEPOWER REQUIRED:** average less than 3 hp. per unit.

**MASTER CONTROL:** starts, stops all units in series at once.

**NO ALIGNMENT WORRIES:** easily pushed into place for minimum spillage.

**"SPOTTED" IN MINUTES:** manually, or pulled by shuttle car loader, etc.

**ADJUSTABLE HOPPERS:** for telescoping conveyors.

**PROVED IN SERVICE:** backed by extensive operating tests.

**BUILT BY BARBER-GREENE:** long a leading builder of portable conveyors—and coal mine conveyors.

*On Display in Cleveland at the Coal Show.*

Get the full story of how this Model 366 Conveyor can save time, manpower and add flexibility to your mining operations. Write Barber-Greene Company, Aurora, Illinois.

# Barber-Greene

AURORA, ILLINOIS

at the working face . . .

# GIVE 'EM AIR

## at the lowest possible cost!

Above ground it's free, but down in the bowels of the earth, where men mine the pay-lode or build tunnels for the benefit of humanity, *AIR* and its *DELIVERY COST* are vital factors.

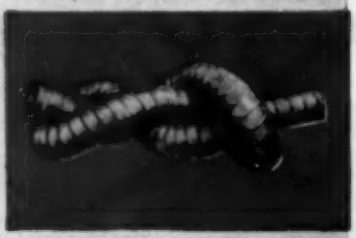
SPIRATUBE-M and AYRTUBE cut Air *Delivery Costs*. Made specifically for mine and tunnel ventilation, these two new *AIRDUCTS* working individually or in combination, deliver a maximum cubic measure of air right at the working face and at the lowest possible cost—because—ease of handling reduces installation costs, and construction features minimize leaks and seepage. You get the full volume created by your fans and blower units right where you need it—at the working face—reducing power costs.

Immediately available in tough high count jute and other fabrics, all specially treated and heavily coated inside and out to withstand fungus and mildew and rough usage.

Extremely flexible special (patented) built-in couplings eliminate fabric mangling—parts are never laying about to create accident hazards.

SPIRATUBE-M and AYRTUBE save labor—cut fatigue—step up output—cut maintenance costs.

**SPIRATUBE-M — (DIAMETERS to 30 INCHES)** Especially designed for both positive and negative pressure, or reversible systems. Replaces rigid ducts. Offers great savings in shipping, installation, maintenance, and storage costs. Patented concealed spring wire construction springs to work and stays extended. Built-in quick couplings with joints lock ringed against blast concussion. No fittings required for turns or bends.



**AYRTUBE — (DIAMETERS to 36 INCHES)** Heavy duty pressure ventilation tubing without wire reinforcement. Quick coupling ends and lock rings interchangeable with SPIRATUBE-M. Materials and constructions meet Flexible Tubing Standards. Full line of special fittings available.

**Flexible Tubing Corporation, Guilford, Conn.—Dept. B**
**Western Office: 416 Citizens Bank Bldg., Pasadena 1, California**
Send us more information. Spiratube-M ☐ Ayrtube ☐

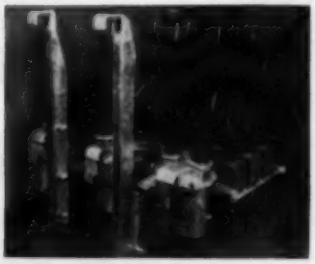
FLEXIBLE TUBING CORPORATION
SPIRATUBE
GUILFORD, CONNECTICUT, U.S.A.

Name .....
Title .....
Company .....
Address .....
City ..... Zone ..... State .....

5-51-12A

## Explosion-Proof Motors More Easily Repaired (7)

Two-stud brush rigging, making all brushes accessible through two topside bronze-covered handholes, facilitates brush inspection and replacement on new line of low- and medium-voltage explosion-proof motors, now available in from ½ to 60 hp ratings with series, shunt or compound windings. Cable gland design permits cable replacement without removing end shield or working through commutator access openings. Vacuum-impregnated Glyptal resins and finish coat of Glyptal enamel insure high-dielectric and non-checking, moisture-resisting insulation, according to the company. Strap or foot mountings are optional. *General Electric Co., Schenectady 5, N. Y.*



## Pole-Top Capacitors Fill Extra-KVA Need (8)

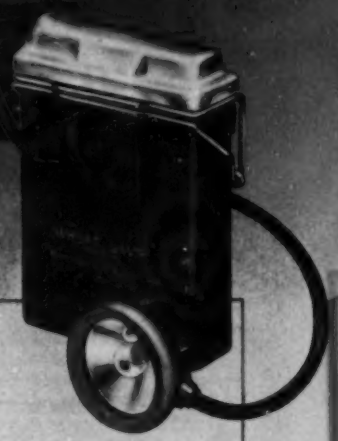
Small packaged capacitor bank, consisting of nine 25-kva capacitor units and three solenoid-operated Type CSO-1 switches, is assembled, wired, tested and delivered ready to hoist into place on pole crossarm, with only three line and three control-wire connections required at point of use. Recent development of 200-amp 15-kv load-interrupter switch (CSO-1) now makes possible wider use of small automatically-switched capacitor banks to meet demands for quick additional kva capacity, according to the manufacturer. Available with either 9 or 12 capacitors, rated 15 or 25 kva, 2,400 v to 7,960 v, with time clock and voltage or current controls optional. — *Westinghouse Electric Corp., Pittsburgh 30, Pa.*

**Postage-Free Card Faces p 132**

A MESSAGE OF INTEREST TO MINING MANAGEMENT IN EVERY COAL-PRODUCING STATE

# In WEST VIRGINIA

## the trend is to WHEAT



The consistently steady increase in the number of WHEAT Electric Cap Lamp installations in West Virginia marks today's strong and unmistakable trend toward lower lamp-handling costs. WHEAT's *true* self-service *pays.* The facts merit your consideration—let us detail them!

### WHEAT-EQUIPPED MINES in the Largest Bituminous Coal Producing State:

A. C. & P. Coal Company
Algoma Coal & Coke Company
Ames Mining Company
Amherst Coal Company—4
BEM Coal Company—2

Big Eagle Coal Company
Browning Coal Company
Birch Mining Company
Black Band Coal Company
The Carbon Fuel Company

Cedar Grove Collieries, Inc.
Chafin Coal Company
Christian Colliery Company—2
Clean Coal Company
Coalridge Coal Company

Carreole Mining Corporation
Crooked Creek Coal Company
Eastern Gas & Fuel Associates—3
Elk Creek Coal Company
Ethel Chilton Mines—2
Farley & Wood Coal Company

Five Block Coal Company
Glogora Coal Company
Glen Eagle Coal Company
Greenbrier Sewell Coal Company
Gulf Smokeless Coal Company
Guyan Eagle Coal Company—3

H & H Coal Company
Hopkins Coal Company
Iman Mining Company
Imperial Smokeless Coal Company
Indian Coal Company

Island Creek Coal Company—3
James Coal Company
Joan Ann Coal Company
King Coal Company
F. M. A. Leach Coal Company

Loccony Smokeless Fuel Company
Lieving Coal Company
Lewis Coal Company
Logan-Chilton Coal Company
Logan County Coal Corporation—5

The Lorado Coal Mining Company—3
Merrill Coal Company—2
Milburn By-Products Coal Company
The New River Company—4
Panther Coal Company of West Virginia

Peasers Branch Coal Company
Phillips Coal Company
Pond Creek Pocahontas Company
Princess Dorothy Coal Company
Raleigh-Wyoming Mining Company
Richwood Sewell Coal Company

Ridgeview Coal Company
Riverton Coal Company
Robinson Run Coal Company
Roboy Run Coal Company
Rosedale Coal Company

Semet Solvay Division,
Allied Chemical & Dye Corporation
The Snap Creek Coal Company—2
Sport Coal Company
The Spruce River Coal Company
Stanford Coal Company

Sterling Smokeless Coal Company
Stollings Coal Company
Town Creek Coal Company
Turkey Gap Coal & Coke Company
Warner Collieries Company—4

Webb Coal Mining Company
West Fork Collieries, Inc.
West Virginia Brick Company
West Virginia Coal & Coke Corporation
Westover Mining Company

Wilcox Coal Company—2
Winiala Coal Corporation
Workman Coal Company
Wyatt Coal Company—4
Young & Weeks Coal Company
Ziegler & Vance Coal Company

NOTE: The figure after the company name indicates the number of mines using Wheat Lamps.

*At the Coal Show*

YOU ARE CORDIALLY INVITED TO VISIT OUR EXHIBITS

BOOTH 2415
Lower Lakeside Mall

BOOTH 1200
Arcade Floor

Cleveland Auditorium May 14-21

## NATIONAL MINE SERVICE COMPANY

*Has the facilities . . . Delivers the goods*

BEMECO DIVISION
Beckley, W. Va.

ALL-STATE DIVISION
Logan, W. Va.

WHITEMAN DIVISION
Indiana and Altoona, Pa.

KY.-VA. DIVISION
Jenkins, Ky.

ANTHRACITE DIVISION
Forty Fort, Pa.

WESTERN KY. DIVISION
Madisonville, Ky.

# LONG PIGGYBACK MINING

© Trade Mark Reg'd. Applied For

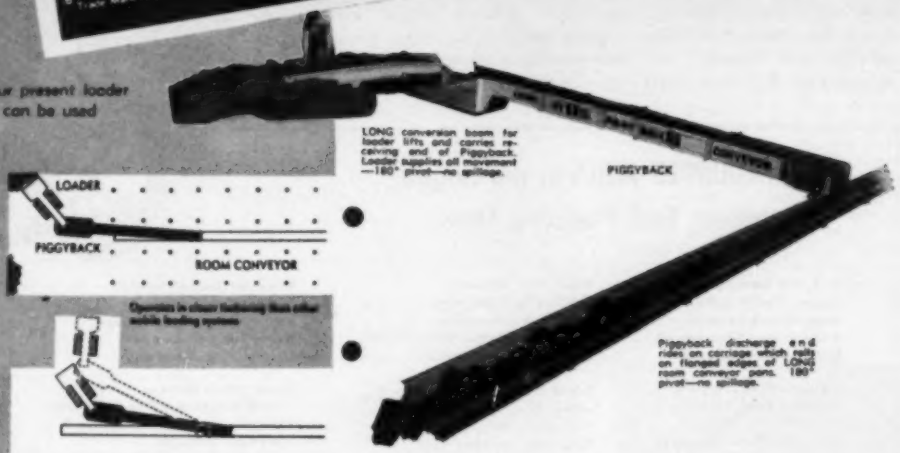
## The New Continuous Haulage System

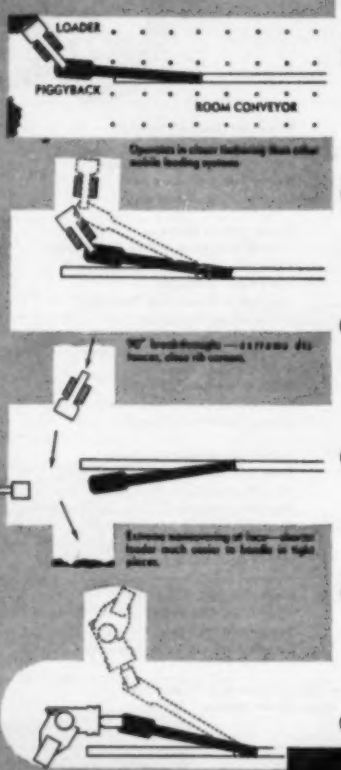
★ FOLLOWS THE LOADING MACHINE AUTOMATICALLY

★ CENTERS LOAD AUTOMATICALLY

★ FREES THE LOADER OPERATOR TO DEVOTE HIS WHOLE ATTENTION FORWARD, TO ACTUALLLY LOAD COAL CONTINUOUSLY

Your present loader can be used


LONG conversion boom for loader lifts and carries receiving end of Piggyback. Loader supplies all movement —180° pivot—no spillage.
PIGGYBACK
Piggyback discharge end rides on carriage which rests on flanged edges of LONG room conveyor pans. 180° pivot—no spillage.




One man, with his helper, operates the loader-Piggyback-room conveyor combination as one machine. He devotes his full attention to keeping the loader in coal—loading continuously. He never has to look back to see if his receiving medium is in place —never has to reposition his rear conveyor—never has to tram coal on the loader—never has to stop for pan-ups during the loading cycle. No one else so much as pushes a button as the coal moves continuously out of the room.

Standard caterpillar-mounted loading machines are all adaptable to the Piggyback system. All that is required is a simple conversion consisting of removing the conventional swinging boom and replacing it wth a short, straight unit designed by LONG for use with the Piggyback. The one loading machine may load in two or more faces with room conveyor and Piggyback in each room.

Conversion to the Piggyback system is therefore possible with less cost and with far greater advantages to be gained than with any other mine modernization plan.

**Booth No. 906**
**CLEVELAND COAL SHOW**
**May 14-17**

**LONG SUPER MINE CAR CO., INC.**
FAYETTEVILLE • WEST VIRGINIA
Manufacturers of
Chain Conveyors and Conveyor Equipment for modern mining

C ONSERVATION
M AINTENANCE
P LAN
BY
QUAKER

# HOW TO GET More Production... Less Maintenance

## QUAKER'S COMPLETE PLAN FOR LONGER PRODUCTIVE LIFE FROM INDUSTRIAL RUBBER PRODUCTS

Now, to meet the need to produce more with less, put the QUAKER Conservation Maintenance Plan to work immediately in your operations.

Developed by the Quaker staff, CMP includes a big factual booklet on how to make conveyor and transmission belting, hose, and packings last longer. Charts are available for bulletin boards. Technical bulletins will be issued periodically. It's a complete, practical, easily applied plan that will help every man in your mine to conserve rubber, reduce maintenance, and increase production!

Whether it's the belt on the main power drive, the conveyor system, or the hose on the lower level, Quaker's CMP will help you save time, material and money. Write for the complete plan.

**GET YOUR COPY**

*of this big factual booklet and other helpful data of the QUAKER C M P program. No charge, no obligation. Yours to help you get more out of industrial rubber products.*

**IF YOU ATTEND IN CLEVELAND**

**The 1951 Coal Show**

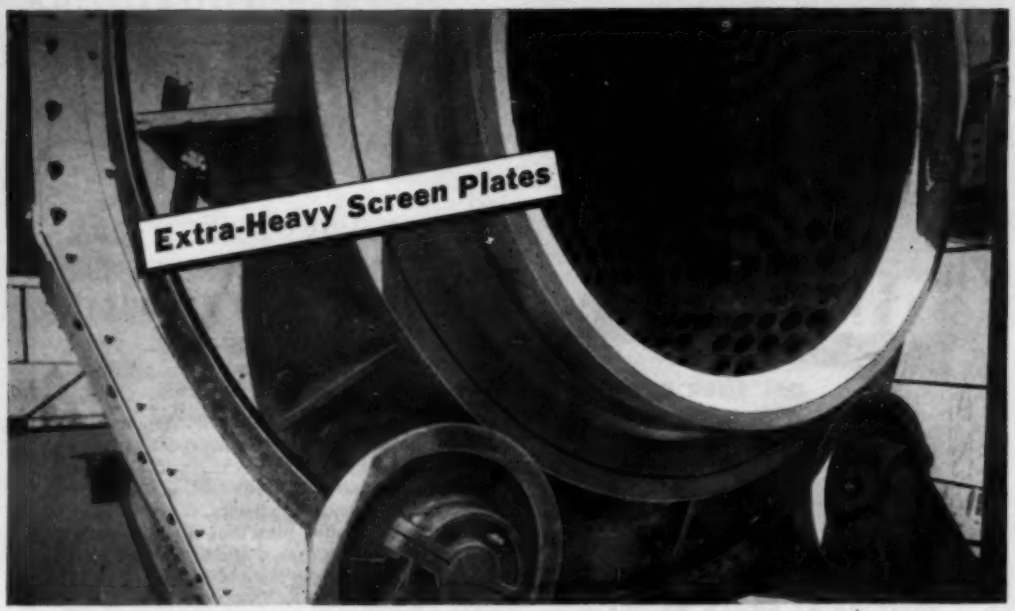
**VISIT US AT BOOTH No. 913**

# QUAKER RUBBER CORPORATION

DIVISION OF H. K. PORTER COMPANY, INC.

PHILADELPHIA 24, PENNA. BRANCHES IN PRINCIPAL CITIES

# BIG FEED OPENING




## CONDITIONS COAL FOR CLEANING PLANTS

PENNSYLVANIA
BRADFORD BREAKER

PENNSYLVANIA CRUSHER COMPANY

### Removes Largest Rock & Debris

Built specifically for coal mine and cleaning plant service, Pennsylvania's heavy-duty Roller-Mounted Bradford Breakers have *no obstructions* at the feed *or* discharge ends. Large coal, rock, mine timbers, tramp iron move freely into the Breaker and out the refuse chute. Equally important, Pennsylvania's "Laclede" screen plates are extra thick section and double-bolted, absorb years of punishment. When those large rocks come up with the coal, a Pennsylvania can handle them.

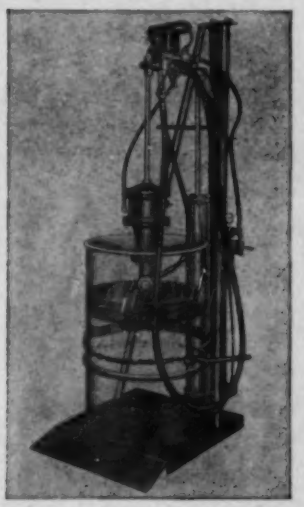
Don't try to make an obsolete or light-duty breaker do a job it wasn't designed for—the result can only be damage, delay and costly repairs. Instead, install a Heavy-Duty, Roller-Mounted Pennsylvania. These specially-designed Breakers soon pay for themselves in trouble-free, low-cost service.

Incidentally, Pennsylvania Bradfords mechanically remove *all* hard debris larger than screen perforations. They greatly reduce the load of refuse handled by cleaning plants and protect washers against damage by large debris. Capacities to 1500 TPH. Low power demand. Write for Bulletin 3007.

PENNSYLVANIA CRUSHER COMPANY, *Division of Bath Iron Works Corporation,* 1711 Liberty Trust Building, Philadelphia 7, Pennsylvania. Representatives in New York—Boston—Pittsburgh—Birmingham—Roanoke—Detroit—Chicago—St. Louis—Crosby, Minn.—Los Angeles—London, England.

## New Equipment Shorts

(14) INDUSTRIAL TELEVISION. Utiliscope, consists of camera, power unit and viewer, total weight 118 lb, for monitoring industrial activities that cannot be directly observed. Mining applications include shaft exploration, process-control in preparation plants. Bulletin 1025 available. — *Diamond Power Specialty Corp., Lancaster, Ohio.*



(15) FOR DELIVERY OF HEAVY LUBRICANTS and mastic materials which will not readily seek their own levels, new Lincoln Engineering hydraulically operated single Air Ram elevator designed for use with its heavy-duty deluxe air-motor-operated drum pumps, exerts 7,110-lb pressure and completely empties and cleans sides of 400-lb or 55-gal drums, the manufacturer says. Bulletin 678 offering complete details available from *Lincoln Engineering Co., St. Louis 20, Mo.*

(16) AN IMPROVED FLOW INTERLOCK, a device that closes an electrical contact when flow of water exceeds a preset quantity and opens it when the flow falls below, may be used as a safety or control unit in a wide range of applications, it is said. Only one screw adjustment is needed to set the circuit for any flow from ½ to 4 gpm. The flow interlock has union fittings at each end to simplify installation and is rated at 10 amp at 120 or 240 v AC.—*General Electric Co., Schenectady 5, N. Y.*

**YES—I would like more information . . .**

**Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (May, 1951)**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 7 | 10 | 13 | 16 | 19 | 22 | 25 | 28 | 31 |
| 2 | 5 | 8 | 11 | 14 | 17 | 20 | 23 | 26 | 29 | 32 |
| 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 |

**In addition, please send me data on these OTHER products advertised in this issue (give name and page number)** .....

.....

**My Name** .....**Position**.....

**Company** .....

**Address** .....

(Good only if mailed before July 1, 1951)

## USE THIS CONVENIENT CARD

**. . . TO GET MORE INFORMATION on products and bulletins mentioned in this Equipment News Section or for data on any product advertised in this issue. Circle item numbers, tear out and mail.**

(17) FURNISHING A FLOW OF OXYGEN ON INHALATION to automatically satisfy any breathing demand of the wearer, the new portable M-S-A oxygen-therapy unit is recommended by the maker for industrial and fire-fighting emergencies and as particularly suited for treatment of cardiac emergencies, gas, smoke and carbon-monoxide inhalation. Capable of supplying oxygen needs for 90 min, the unit is mounted on a lightweight metal frame with a clamp and leather handle for ease of handling, and has a 40-cu ft oxygen cylinder. Bulletin CW-6 available from *Mine Safety Appliances Co., Pittsburgh 8.*

(18) LINE OF DIESEL CRAWLER TRACTORS and equipment produced by John Fowler & Co. (Leeds), Ltd. (shown above), and Marshall Sons & Co., Ltd., both of England, now are available for prompt delivery through the U. S. distributor. The units range from 20 to 95 hp.—*John M. H. Shline Co., New York 17.*

## EQUIPMENT BULLETINS AVAILABLE

(19) COAL CRUSHERS in the Jeffrey line are thoroughly covered in the 40-p Catalog 784-A just put out by the Jeffrey Mfg. Co., Columbus 16, Ohio. It offers full details of design, operating characteristics, capacities and specifications, including dimension drawings, on a wide range of types and sizes and would be a helpful booklet to have on hand if you're concerned with crusher operation.

CARD USERS NOTE—Please be sure to give your name, position and company to insure proper handling of your request. Since some cards have been received without names, we would be glad to have you check us if you have no response to your request within a reasonable time.

(20) IF YOU USE WIRE-ROPE AND CHAIN FITTINGS, the new revised and enlarged data book, combining engineering information with an extensive catalog of its complete line of wire-rope and chain fittings, offered by The Thomas Laughlin Co., Portland 6, Me., should be helpful. Catalog 150 includes detailed working

FIRST CLASS
PERMIT NO. 64
(Sec. 3.49, P.L.&R.)
NEW YORK, N. Y.

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

Postage Will Be Paid By—

McGRAW-HILL PUBLISHING CO., INC.

THE EDITOR, COAL AGE

330 WEST 42nd STREET

NEW YORK 18, N. Y.

characteristics of each product to remove guesswork in selection, and lists many new Laughlin products being added to its regular line to serve where expensive "special" fittings formerly were necessary, the company says.

(21) COAL-HOIST SKIPS—New bulletin offers full design and operating data, with scale drawings, of the Connellsville (Lepley) bottom-discharge skip available in capacities of 6 to 12 tons. The bottom-dumping feature is said by the maker to provide high-capacity economical hoisting. Available from The Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

(22) CHAIN FOR COAL CONVEYORS—Bulletin 251 describes Oro Kenkrome chain for conveyors in coal washing and sizing service, made of an alloyed manganese steel. Available from Kensington Steel Co., Chicago 28, the bulletin also details renewable-tooth sprockets, wash-box chain, coal-crusher roll segments and power-shovel parts.

(23) EARTHMOVING LINE of equipment made by the Athey Products Corp., Chicago 38, is illustrated in the handy pocket-sized Athey condensed catalog designed to fit in the inside coat pocket and provide immediate specifications without the necessity of referring to various files or catalogs.

(24) PORTABLE LIGHTING AND TOOL-POWER LINES — Bulletin SL202, Joy Mfg. Co., Dept G-1, Pittsburgh 22, Pa., describes the many combinations and variations of Joy String-a-lite sectionalized assemblies said to simplify installation, reduce maintenance and increase the safety of temporary installations and to be fully re-usable over and over.

(25) ONE OF THE BROADEST LINES OF GENERAL PURPOSE PUMPS offered by any manufacturer is described in Bulletin B-2300 published by Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles 31, the company reports. The Peerless Fluidyne pumps covered in the 24-p booklet are of the horizontal end-suction centrifugal type and may be driven by electric motors from ¼ to 150 hp, with a capacity range from 10 to 5,500 gpm, with heads up to 260 ft.

(26) SYNCHRONOUS-MOTOR CONTROLS—Bulletin 3100-PRD-204 on polarized-field frequency controls (standard-interrupting-capacity type) for synchronous motors illustrates and describes in detail all the standard types for full-voltage, reduced-voltage and part-winding starting. It contains data on ratings, weights and dimensions, wiring diagrams, and layout drawings and specifications for each type of control. Available from the Electric Machinery Mfg. Co., Minneapolis 13, Minn.

(27) ELECTRIC CABLE HOISTS—Bob-Cat heavy-duty electric-cable hoists are described in a new bulletin offered by the Ohio Hoist & Mfg. Co., Cleveland 5, Ohio. The catalog illustrates the various types of suspensions and gives detailed specifications on the 1- to 5-ton models, with lifting capacities, heights, lifting speeds, weights and overall dimensions.

(28) HOW TO PROTECT CONCRETE FLOORS against excessive water conditions, oils, greases and acids by the simple application of an easily mixed ½-in topping of Stonhard Stonpach is described in a folder available from the Stonhard Co., Philadelphia 23. Stonpach is highly resistant to these conditions and provides a flint-hard surface that can withstand a terrific beating, the maker says.

(29) PINIONS AND GEARS FOR TRANSPORTATION EQUIPMENT are discussed in Bulletin GEA-1054B available from the General Electric Co., Schenectady 5, N.Y. The bulletin describes GE's manufacturing and testing facilities for gear manufacturing and provides a complete nation-wide list of gear-sales outlets and apparatus-service shops.

(30) STEEL SHELVING, clothing lockers, storage cabinets, waste receptacles and other steel equipment are described, with prices, in a new circular available from Precision Equipment Co., Chicago 41.

(31) ELECTRIC MOTORS—New 28-p Booklet B-4739 available from Westinghouse Electric Corp., Pittsburgh 30, Pa., covers the application and characteristics of the large polyphase induction motor, with a quick summary of the types and features of the two basic kinds—Type CSF squirrel-cage motors for constant-speed drive and Type CWF wound-rotor motors for adjustable-speed drive, both available in a wide range of open, dripproof and special enclosures.

(32) SELECTION OF CENTRIFUGAL PUMPS of the single-stage split-case type is simplified by the performance table in its new Bulletin 5004-A offered by the Deming Co., Salem, Ohio. With the table, it is easy to pick units meeting specific requirements for capacities from 25 to 4,000 gpm and total heads from 20 to 300 ft. The bulletin provides full data on the design and features of the Deming pumps, which are furnished for direct connection to electric motors, steam turbine or gasoline engines, or with belt drive from any source of power.

(33) USER CONSERVATION OF INDUSTRIAL RUBBER PRODUCTS and increased output from present equipment are the primary objectives of the "Conservation Maintenance Plan" offered by the Quaker Rubber Corp., Philadelphia 24. Included in Quaker's CMP program are a handbook, wall charts and monthly bulletins (left) that contain hundreds of illustrations and suggestions on how to select, install and maintain conveyor belting, flat transmission belting, hose, V-belts and packing. Called a "practical approach for 'making the most' out of rubber products on hand" by J. R. Koach, vice president and general manager, the CMP program is available to customers and non-customers alike as part of Quaker's effort to help the nation conserve rubber and obtain more service from rubber products.

# How to cut loading time and repair costs...

SUPERLA Mine Lubricants have reduced loader-clutch repair costs as much as 50% in midwest mines. They have eliminated delays for "warming up" loaders. They have made possible easier and faster loading. Here's why they will assure similar benefits for you:

Superla Mine Lubricants keep transmission cases clean. Clutches operate easily with no gumming or coking caused by oil deposits. When machines are started, these lubricants flow readily between clutch plates, *protect them against wear, eliminate "clutch drag" and the necessity for warming up loaders.* During long periods of continuous operation, Superla Mine Lubricants do not thin out excessively, provide safer lubrication for clutch plates.

A test of Superla Mine Lubricants will prove their ability to keep your loaders on the job longer with less maintenance. These products are available in oil and grease grades suitable for any type of cutter or loader. A Standard Oil Lubrication Engineer will gladly help you select the proper grades for your equipment.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

## SIX GRADES FOR LUBRICATING ANY TYPE OF CUTTER OR LOADER

**No. 00.** An oxidation-inhibited oil containing a detergent additive. It provides exceptionally clean operation and low oil consumption for oil-lubricated gear cases.

**No. 0.** A high-quality additive-type oil similar to No. 00 but of a slightly heavier grade. It is designed for Goodman loaders and cutters.

**No. 2.** A soft, semi-fluid grease for lubricating gathering-head gear cases where greater fluidity is desired than that usually provided by most loader greases.

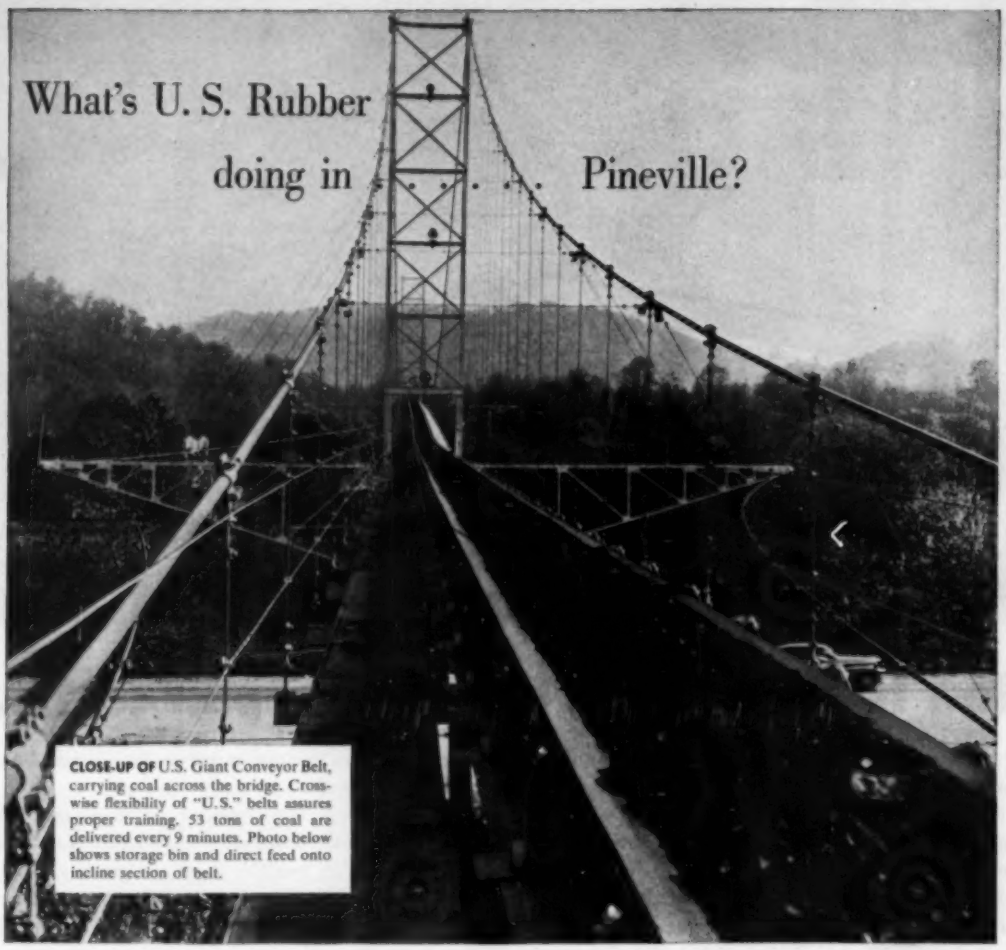
**No. 4.** A semi-smooth grease particularly resistant to thinning out under heat and mechanical working. At the same time it can easily be poured from the barrel bung at ordinary mine temperatures. It is especially designed for Joy loaders.

**No. 6.** A grease of heavy consistency and good high-temperature characteristics. Its fibrous structure makes it particularly useful on mine car wheels and for general underground lubrication.

**No. 8.** A smooth grease having superior high-temperature characteristics. It is suitable for armature bearings and pressure-gun work where a grease of heavy consistency is desired.

**STANDARD OIL COMPANY (INDIANA)** STANDARD

# What's U. S. Rubber doing in . . . . . Pineville?



**CLOSE-UP OF** U.S. Giant Conveyor Belt, carrying coal across the bridge. Crosswise flexibility of "U.S." belts assures proper training. 53 tons of coal are delivered every 9 minutes. Photo below shows storage bin and direct feed onto incline section of belt.

In this Kentucky town, "U.S." belting is carrying coal across a river from the mine to a power plant, via a suspension bridge. This belt has brought about a trouble-free, quicker, more economical operation than had been possible with other methods. There are many, many "U.S." belting installations throughout the world, some big, some small—each of them proof that United States Rubber engineers know how to solve haulage problems and reduce expenses. Write to address below.

PRODUCT OF

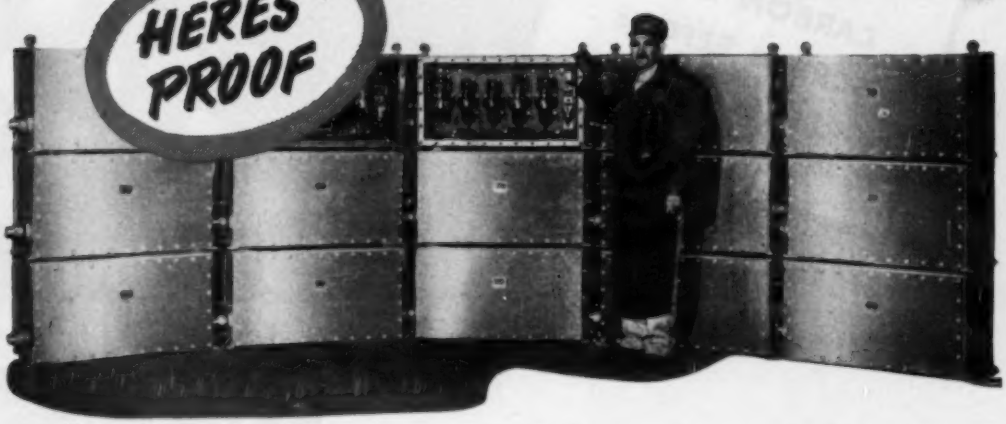
U.S. RUBBER
SERVING THROUGH SCIENCE

**UNITED STATES RUBBER COMPANY**

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

# ENSIGN-CLARK *Explosion Tested* MAGNETIC STARTERS ARE BETTER!

HERE'S PROOF



This picture shows fifteen 50 H.P. 230-volt Explosion-tested starters furnished a large mining company for use on air compressors.

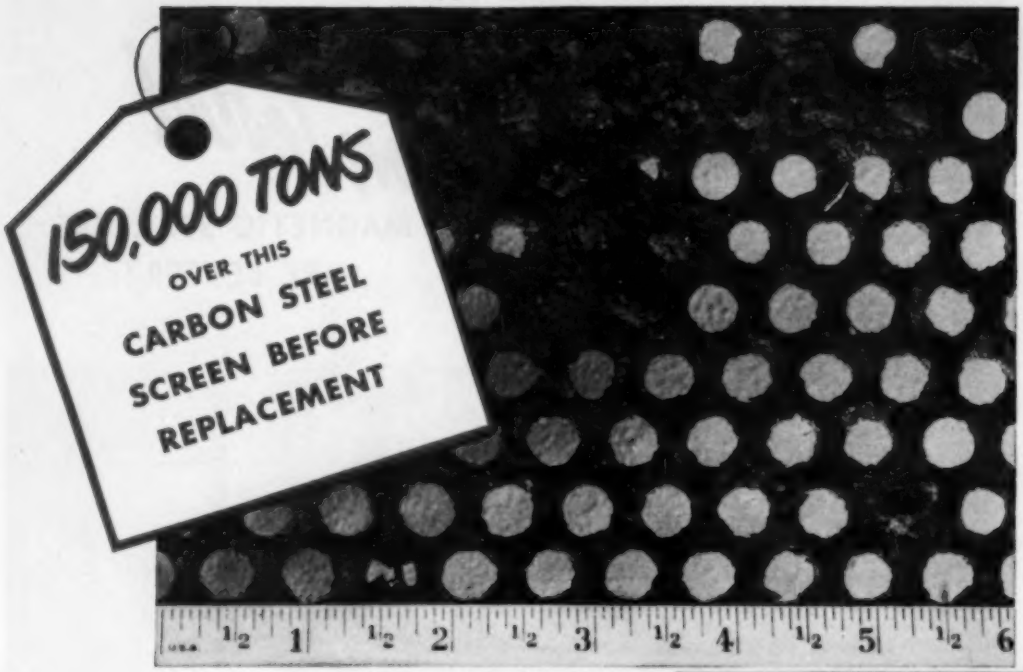
We specialize in the manufacture of heavy-duty mine starters, both Standard and Explosion-tested enclosures.

Send us your inquiries for any standard or special purpose equipment.

ENSIGN

914 Adams Ave. Huntington 4, W. Va.

SEE THESE SCREENS IN OUR EXHIBIT




# Look at the difference Stainless

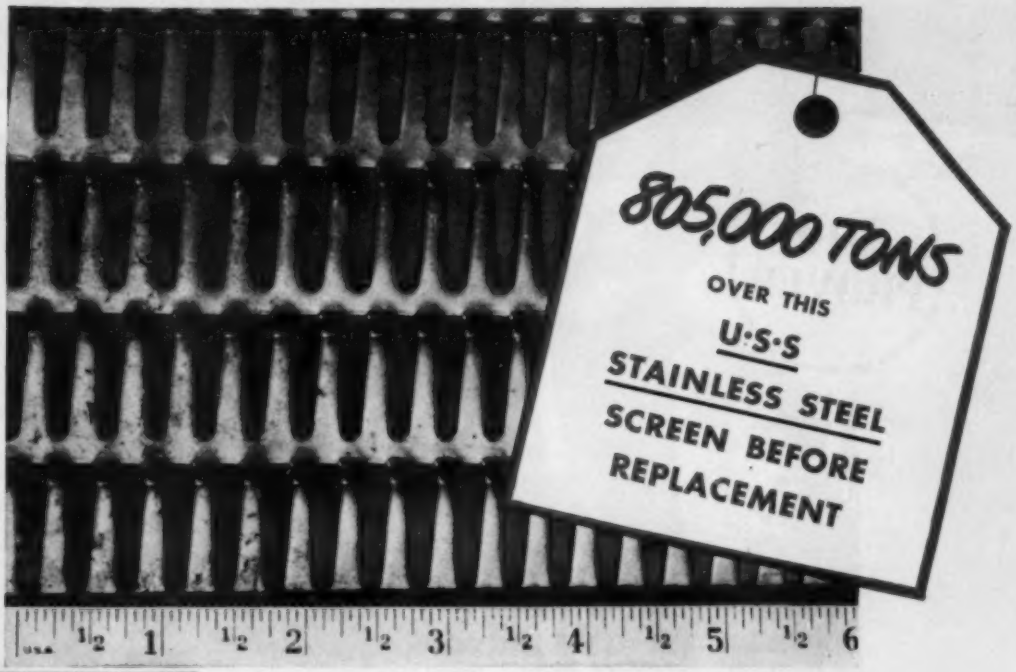
These screens saw service at Sunnyhill Coal Company's New Lexington, Ohio, preparation plant. Both were installed on the bottom deck of a three-deck shaker for dewatering and sizing wet coal to ¼" x 0.

The carbon steel screen—14-gage with ¾" holes—was in service for one year, handling approximately 150,000 tons. Mud and elongated slivers of coal caused severe blinding. Rusting and abrasion shortened screen life, and the rough, blinded surface caused coal to move slowly and build up on the deck.

The U·S·S Stainless Steel screen—12-gage with ⅛" x ⅝" x ¾" shortslots (equivalent to ¾" round hole)—was

Sunnyhill Coal Company's preparation plant, New Lexington, Ohio.

AT THE COAL SHOW




# Steel makes in coal screen life—

## *plus a saving of $1,000 in labor charges alone for Sunnyhill!*

in service for two years and four months, handling approximately 265,650 tons of ¼" x 0 coal and 539,350 tons of 1" x ¼" or 1¼" x ¼" stoker coal. This Stainless screen was free from corrosion and blinding . . . had great resistance to abrasion . . . allowed coal to move freely.

In addition to handling more than five times the tonnage, Sunnyhill officials report that this Stainless screen, because of its longer service life, not only saved the replacement cost of one set of carbon steel screens, but also saved approximately $1000 in labor charges for screen changes. What's more, the reduced down time, both for cleaning and changing screens, meant worthwhile additional tonnage.

Take advantage of this increased tonnage and savings in labor in your preparation plant. When changing screens, check with your supplier on Stainless Steel. And for finest performance, specify U·S·S Stainless Steel for your screens.

IRON AND STEEL
SCRAP is a
VITAL DEFENSE MATERIAL
LET'S GET IT TO
THE MILLS
IT MEANS MONEY FOR YOU
MORE STEEL FOR AMERICA

AMERICAN STEEL & WIRE COMPANY, CLEVELAND • COLUMBIA STEEL COMPANY, SAN FRANCISCO
NATIONAL TUBE COMPANY, PITTSBURGH • TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

## U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

1-773

UNITED STATES STEEL

# SUNVIS SLASHES DOWNTIME

**Sticking Valves and Rings, Blow-by, Crankcase Dilution, Bearing Failures—All Are Practically Eliminated**

A coal mining company, working six strips at one time, kept 26 bulldozers operating continuously on a three-shift schedule.

The dozers lost efficiency from inadequate lubrication. Frequent oil changes did little to correct sticking valves and piston rings, blow-by in the cylinders, and consequent crankcase dilution. Bearing failures occurred frequently and every shutdown of a dozer cost two full days of its production.

After experiencing the same poor results with two different oils, the company consulted a Sun representative, and on his recommendation turned to the use of a heavy duty Sunvis Oil. Marked improvements were immediately achieved. Freedom from hard carbon keeps valves and rings operating efficiently. Blow-by is no longer a problem. Crankcase dilution has been minimized so that oil change periods are now safely extended. Bearing failures due to faulty lubrication have been done away with. Production goes on according to schedule, and operating costs are much lower.

You owe it to yourself to investigate the remarkable properties of Sunvis Oils. *They're good for the life of your machinery.*

**SUN OIL COMPANY**—*Philadelphia 3, Pa.*
*In Canada:* Sun Oil Company, Ltd.
Toronto and Montreal

**SUN PETROLEUM PRODUCTS**
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO

## Atomic Energy Won't Replace Coal Soon

There is little possibility that atomic energy will replace coal within the lifetime of any living person, Sir Henry Tizzard, prominent scientific advisor to the British government has maintained in a report recently made public.

"I cannot see the slightest evidence that atomic energy can replace coal as the basis of material civilization, nor that the use of atomic energy for the production of power can significantly raise the standard of living of any nation, within the lifetime of any living person," Sir Henry said. "We are only at the beginning of a new adventure," he pointed out. "No one can foresee what may emerge from further research." Although it may be generations before atomic energy is competitive with other fuels, Sir Henry strongly believes that experimentation in the field should be continued.

In making a comparison with the previous development of power for industry, Sir Henry said: "The invention of the internal-combustion engine was of far greater economic importance than anything that can at present be imagined to emerge from the exploitation of atomic energy during the next 50 yr. The internal-combustion engine replaced the horse and provided a means of producing cheap mobile sources of power. It did not replace coal; on the contrary, it created indirectly a large additional demand for coal."

## Natural Gas Seeks Steel For Huge Expansion

The natural-gas industry stands ready to expand its facilities by an expenditure of nearly a billion dollars if it can get the steel it needs for pipelines and the approval of the FPC, it was reported April 16.

At the 16th annual meeting of the Gas Appliances Manufacturers' Association, Frederic C. Hess, president, said new applications before the FPC on Jan. 1 called for 15,866 mi of pipeline and that recently authorized construction provided for another 28,875 mi. These projects would require some 6,000,000 tons of steel, Mr. Hess said, but he maintained that its use would provide more fuel and heat than any other project that might be started now.

Additional natural gas would help relieve the shortage of freight cars, he said. "This would be particularly helpful in the case of the perennially scarce high-pressure cars used to transport liquefied petroleum gas, but more widespread use of natural gas would also reduce the burden of coal now being carried by the railroads," he pointed out.

Citing cutbacks in the output of steel pipe, during recent months, Mr. Hess reported that the PAD had asked the NPA to prevent further cutbacks and to boost production.

### Featured in This Section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## BCR Plan-of-Action Group Named to Study Industry

Formulating a program of research and related activities that will satisfy the needs of coal consumers and increase coal markets is the responsibility of 39 top-level coal and railroad executives invited to serve on the new BCR Plan-of-Action Committee, Dr. A. A. Potter, president of Bituminous Coal Research, Inc., announced April 13.

The ultimate objective of the committee is an adequate balanced program of research, engineering and promotion of results that will bridge the gap between research reports and the practical application of technical advancements by coal and railroad companies and coal users. The program grows out of a formal request made by BCR members at the annual meeting March 7. A majority of the men named already have accepted the invitation and the group will hold its first meeting in Cleveland May 15.

In the meantime, a comprehensive survey of the coal, railroad and affili-

(*Continued on p. 166*)

LINE-UP—Old steamers wait to be hauled into shop for rebuilding.

STEAM UP—Ready for service, rebuilt locomotive chuffs onto the main line.

## Old Iron Horses Back in Harness for NYC

DON'T WRITE OFF the steam locomotive yet. The defense boom, with heavier freight traffic, is recalling retired steamers from railroad "graveyards."

Leading the parade is New York Central R. R. In that road's West Albany shops, 1,350 men are turning out six rebuilt steamers every five days. It takes 14 days from the time a retired steamer is hauled out of the "graveyard" until it makes a short run on a test track. Meanwhile, it gets a good sandblasting; wheels and tires are worked over; the boiler is repaired or replaced; the firebox is insulated; and springs are worked over.

Cost of a rebuilding job is about $26,000. That's $423,000 less than the cost of a new two-unit diesel.

# New Joy Research Center To Have Experimental Mine

The first experimental mine to be operated exclusively for the testing of mining equipment is one of the outstanding features of its new research center to be built some 15 mi west of Indiana, Pa., the Joy Mfg. Co. reported April 13. No commercial mineral product will be produced from the operation.

Involving an initial expenditure of $250,000, the new Joy research center will include a laboratory, work shop and other supporting facilities, as well as the experimental mine. Ground is expected to be broken early in May for the 190x70-ft main research building, which will have an initial floor space of 15,000 sq ft and incorporate a flexible design to permit the expansion expected in the company's research activities.

The nature of the mine site offers the company a varied range of mining conditions for the testing of Joy's complete category of mining machinery and equipment and for the application of new machines in both coal and hard-rock mining, both underground and on the surface.

In announcing the project, J. D. A. Morrow, Joy president, said:

"Our directors, in authorizing a quarter-million dollars for the first phase of this research project, have made it possible for this company to start its second century on a more scientific plane of operations. (The component of the company represented by the former Sullivan Machinery Co. began operations in April, 1851.)

"With these research facilities, Joy, for the first time in mining-machinery history, is providing a special proving ground where Joy engineers and those of mining companies can collaborate to screen, test and refine new inventions and improvements without the production delays and difficulties that inevitably occur when such research is attempted in regular production mines and factories.

"Furthermore, the Joy research center will be equipped to build new prototype machines as well as test them in advance of manufacture for sale. This will put the future development of mining machinery on a development level similar to that of other leading American industries."

Joy has purchased the surface rights and leased the necessary mineral acreage and will develop a new drift portal for access to underground operations, the announcement reported. An available highwall will permit development of numerous entries and facilitate testing of such equipment as drills, cutters and mining-machine heads. The coal, shale and sandstone beds contained in the property will make possible simulated coal and hard-rock mining conditions with the full line of Joy equipment.

The new project is under the technical supervision of Dr. T. H. Troller, vice president in charge of engineering, and A. Lee Barrett, research engineer. Work is already under way on the engineering and site preparation and the research center is scheduled to be completed this fall.

## National Safety Contest Set for Top Mine Teams

Plans for a nationwide 3-day first-aid and mine rescue contest in the Nation's Capital this fall—the first one held in the United States in 20 years—were discussed and committees were named at a conference called in Washington, D. C., recently, by James Boyd, director of the Bureau of Mines.

Representatives of several state mining departments, coal associations, UMWA, and the bureau who attended the conference tentatively fixed October 3, 5 as the dates for the contest. It is expected to attract some 75 or 80 crack first-aid and mine rescue teams from mines all over the country. International and national contests of this type were held in the U. S. for many years until the last one in Louisville, Ky., in 1930, when the depression of the early 30's and World War II discouraged the sponsors and participants.

The group selected the National Capital as the site for the resumption of the national event contingent upon committee investigations of housing and other facilities. A large open space is required for the contests if the weather is good, and adequate indoor space if there is rain. Two cities —Columbus, Ohio, and St. Louis, Mo.—were chosen as alternates in case the event cannot be staged in Washington. With J. J. Forbes, chief of the Bureau's Health and Safety Division, acting as temporary chairman, a number of working committees also were appointed. In addition to the awards to be made to the winning teams, it was thought that the opportunity to visit the Nation's Capital would be welcomed by the teams and their associates.

Cooperating in the conference were representatives of the Pennsylvania, Kentucky and West Virginia mines departments, the UMWA, NCA, BCOA and AMC. Other states and organizations which were unable to send representatives were expected to participate in the future arrangements and planning.

## Powellton No. 3 Cops EG&FA President's Safety Trophy

THE MINE OFFICIALS above saw Joshua Smith, director of safety, Coal Division, Eastern Gas & Fuel Associates, present the president's safety trophy to Shirley Mayes, plant inspector, Powellton No. 3 mine, Elkridge, W. Va., for the best safety achievement in 1950. The bronze plaque, the company's top safety award, was presented at a luncheon Mar. 1. It cites the winning mine for excellence in three respects: lowest accident frequency, lowest accident severity and best mine-inspection rating.

Witnessing the ceremonies were: Cecil Wright (left), chief electrician; H. W. Moore, superintendent; G. D. Holmes, mine foreman; James Turley, Alfred Martin and William Winbush, UMWA safety committeemen; Mr. Mayes; Henry Gordon, Elbert Jordan and Rex Oney, UMWA safety committeemen; Mr. Smith; William Loudermilk, outside foreman; W. W. Hunter, general superintendent; Jim McArdle, tipple foreman; W. A. Rowland, general inspector; and L. M. Platt, mine foreman. Attending the luncheon but not shown in the photograph were: Alex Hyslop, mine accountant; and Mrs. Flo Canterbury, acting supervisor of nurses.

# ARMY IN OVERALLS 54,000 shopmen see to it that the Freight Cars and Locomotives of the Pennsylvania Railroad are in First-class Condition for Any Demand

With industry geared for new production records, America's railroads, which are the bone and sinew of transportation for both industry and defense, will face an all-time-high demand for freight cars.

Preparing to meet this demand, the Pennsylvania Railroad early last year launched the biggest freight car program in its history. We ordered 20,000 new freight cars costing $114 million. More than 7,000 have been delivered and put to work. All will be on the rails this year. These are in addition to more than 5,000 new cars built in the Pennsylvania's shops since January 1, 1948.

Pennsylvania Railroad shopmen also are rehabilitating 34,000 freight cars. More than 20,000 have been finished and returned to service. The others are coming along at a rate of 187 daily.

The hopper car rebuilding program alone is turning out 110 cars of 50 and 70 ton capacity every working day, equivalent to an increase in daily load capacity of 6900 tons.

The Pennsylvania Railroad is spending a total of more than $217,000,000 for this new and rebuilt freight car program in order to be ready to serve the defense needs of the country.

## PENNSYLVANIA RAILROAD

# PERSONAL NOTES

## Three Operating Executives Figure in P&R Promotions

EDWARD G. FOX (right) last month advanced from general manager to executive vice president, Philadelphia & Reading Coal & Iron Co. Mr. Fox's first position in anthracite mining was with P&R, beginning in 1921 when he worked with the engineering corps during the summer while attending Penn State College. Following graduation in 1924, Mr. Fox held supervisory and executive positions with several anthracite companies. In March, 1946, he resigned as president of the Phoenix Contracting Co. to become president of the Shen-Penn Production Co., a newly formed subsidiary of P&R. He was named P&R general manager Nov. 1, 1947.

G. A. SCHNEE (left), superintendent of the Ashland Div., was named general superintendent for the company, and Francis W. Chesney (right) was appointed division superintendent to succeed Mr. Schnee. With P&R since 1921, Mr. Schnee was named engineer at Potts colliery in 1930 and in 1941 was advanced to assistant engineer in the Ashland Div. He became assistant division engineer in 1943 and later that year was made division engineer. He had served as division superintendent since March, 1948. Mr. Chesney joined P&R in 1918, when he started with the engineering corps. He has served as division engineer in the company's Shamokin and Ashland divisions, and for the past several years has been assisting in the preparation of grievance cases before the Anthracite Board of Conciliation.

## EG&FA Officials Resign to Manage Own Operations

**M. ALBERT EVANS AND M. L. WORKMAN (l and r), both with the Coal Division, Eastern Gas & Fuel Associates some 25 yr, resigned April 1 to take over active management of coal mining companies in which they and their families have interests. Mr. Evans, whose first job with the company was as a mining engineer, had been supervisor of mining operations at the 22 EG&FA mines in West Virginia, Pennsylvania and Kentucky. Mr. Workman started with the company as a member of the engineering corps and at the time of his resignation was manager of low-volatile division, which includes mines in Raleigh and McDowell counties, West Virginia.**

**Mr. Evans reported that he and Mr. Workman both have interests in the Cliff Coal Co., Bluefield, W. Va., and that he and his family have investments in the Pine Township Coal Co., Inc., Heilwood, Pa., and the Rhems Coal Co., Youngwood, Pa. He will make his headquarters in Heilwood. Mr. Workman will head the Workman Coal Co. Peytona, W. Va., replacing his father, Everett C. Workman, who is retiring. He also will assume active management of the Bluefield Pocahontas Coal Sales Co. and will make his headquarters in Bluefield, W. Va.**

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**Woodward J. Travis** has been named manager of operations and properties, Whitwell coal mines, Tennessee Products & Chemicals Corp., Whitwell, Tenn. Mr. Travis formerly was in charge of Whitwell truck mines producing 1,000 tpd for the Southern Ferro Alloys Co., a subsidiary of T.P.& C.C., and will continue to serve as treasurer of that subsidiary.

**Maynard L. Patton**, vice president, Truax-Traer Coal Co., has been named a consultant to the Defense Solid Fuels Administration, Secretary of the Interior Oscar Chapman announced last month. Mr. Patton will serve on an intermittent basis, without pay. Mr. Patton also was named a consultant to the DPA.

**S. C. Harvey** has been named manager of mines for the Utah Fuel Div. of the Kaiser Steel Corp., succeeding **R. C. Oliver**. Mr. Harvey joined the Utah Fuel Co. (purchased by the Kaiser interests in 1950) in 1915, and has served as fireboss, mine foreman, and superintendent of the Somerset mine, Somerset, Colo. He also will continue as superintendent of the Castle Gate (Utah) mine, the post he held at the time of his new appointment.

The formal appointment of **George A. Lamb** as acting chief of the Solid Fuels Branch of the OPS was announced late in March by Michael V. DiSalle, OPS director. Mr. Lamb has been manager of business surveys for

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## Operating Men Named to New EG&FA Posts

H. JOHN HARPER

H. A. QUENON

the Pittsburgh Consolidation Coal Co., Pittsburgh, since 1946.

Three top level appointments in operating management have been announced by L. C. Campbell, vice president, Coal Division, Eastern Gas & Fuel Associates, effective April 1. **H. John Harper**, formerly assistant to Mr. Campbell, has been named general manager of mines with direct supervision of all mining operations in the Coal Div. He will continue his headquarters in Pittsburgh. **H. A. Quenon**, formerly division manager of the Northern group of mines in West Virginia and Pennsylvania, has been appointed division manager of the low-volatile group of mines in Raleigh and McDowell counties, with offices in Bluefield, W. Va. **W. J. B. Mayo**, previously general superintendent of the Pennsylvania mines of the northern group, has been made division manager for the northern group, with headquarters at Melcroft, Pa. No executive changes were announced for the high-volatile group of mines, managed by **A. P. Boxley**, Beckley, W. Va.

Promotions of **Arno C. Fieldner** and **Louis C. McCabe** to new positions with the U. S. Bureau of Mines were announced April 5 by James Boyd, director. Dr. Fieldner, associated with the Bureau for over 40 yr and internationally known inventor and developer of techniques for testing and analyzing coal, coke and gas, has been named chief fuels technologist in the staff of Director Boyd. He has been chief of the Bureau's Fuels and Explosives Div. for many years. Dr McCabe, assistant chief of the Fuels and Explosives Div., was appointed chief of that division to succeed Dr. Fieldner. Dr. McCabe also has been chief of the air and stream pollution research for the Bureau. He has been with the Bureau since termination of military service in 1946, except for 2 yr when he served as director of the Los Angeles air-pollution-control program.

**Charles S. Blair**, formerly vice president, has been elected president of the Black Diamond Coal Mining Co., Birmingham, Ala.

**William E. McQuail**, general superintendent, was elected executive vice president of the Turkey Gap Coal & Coke Co., Dott, W. Va., at the company's annual meeting. **Helen Tomlinson** was elected secretary.

## Obituaries

**Thomas Murphy**, 70, manager of coal operations, Northwestern Improvement Co., Roslyn, Wash., died March 31 of a self-inflicted bullet wound. Widely known in Western mining circles, Mr. Murphy was earlier active in the Red Lodge (Mont.) coal field. During his many years with NWI he supervised company construction of a wide range of mining equipment and was credited with the development of new-type machinery and the introduction of modern mechanical mining to the company's operations.

**John T. Bartram**, who retired in 1949 after 48 yr with the Pittsburgh Coal Co. Div. of Pittsburgh Consolidation Coal Co., died April 1 at his home in Houston, Pa. During his service with the company Mr. Bartram advanced to the position of division superintendent on its operating staff. For several years before retirement, he was in industrial relations work, devoting most of his time to organizing training classes for Pittsburgh Coal employees.

**John Conlon Sr.**, 89, president of the John Conlon Coal Co. and an independent anthracite operator for many years, died April 10 at his home in Hudson, Pa. Active at his office until about 10 days before his death, Mr. Conlon would have been 90 on May 5. He entered the mines as a boy and became a foreman at 17 and at 31 was a colliery superintendent for The Hudson Coal Co. He founded his own company in 1913. Several years ago Mr. Conlon was cited by the Joseph P. Holmes Safety Association for his many years in coal mining without an accident.

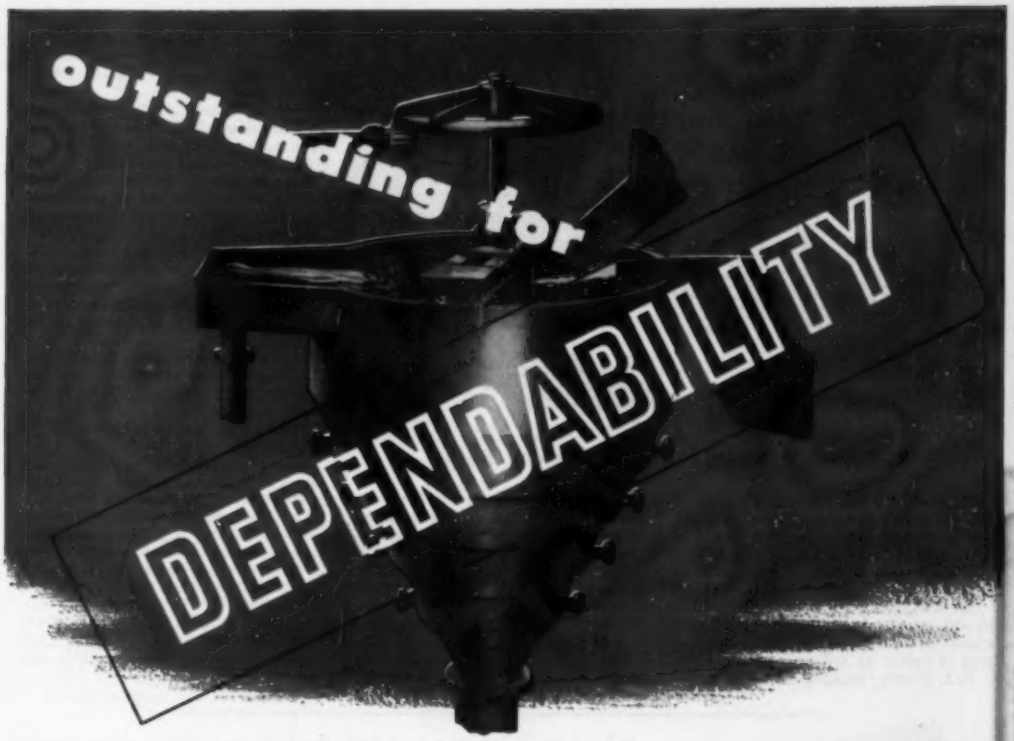
**Howard DeMoss**, 39, assistant superintendent of the Keota mine of the Sinclair Mining Co., was instantly killed March 31 when he was struck by a stripping shovel at the mine.

**Samuel H. Thatcher**, recently named assistant labor relations manager for the Coal Division, EG&FA, Mt. Hope, W. Va., died April 1 at the Beckley (W. Va.) Hospital, after a short illness. Mr. Thatcher joined a EG&FA predecessor company as a rodman and transitman and had held positions as

## J. B. Morrow Retires

J. B. MORROW, first vice president, Pittsburgh Consolidation Coal Co., retired April 9, his 65th birthday, in accordance with the company's retirement plan. Mr. Morrow, who will continue as a director of the company, joined Pittsburgh Coal Co. in 1927 as a consulting engineer. He served as preparation manager from 1929 to 1939, when he was named operating vice president. In 1940 he was elected president, in which post he served until named first vice president of Pittsburgh Consol when that company was formed by merger in 1945. For many years Mr. Morrow has been prominently associated with many industry organizations and activities. He has been a pioneer in the development of coal preparation and has been regarded throughout the industry as an authority on that subject. He served as president of BCR from 1948 to 1950. Mr. Morrow also holds the unusual honor of being the only man to have been awarded both the

Perry Nichols award and the Erskine Ramsay medal for distinguished service to the coal industry.

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***High separating efficiency*** — great recovery of salable coal, close to 100%. Also, from a single Chance Process unit you can obtain a low ash product, medium ash product, and a reject product.

***High degree of flexibility*** — ability to handle coal at operating gravities from 1.35 to 1.65, with size range as wide as 10" x $\frac{1}{16}$" to one washing unit.

***Easy operation*** — change-over from one washing gravity to another can be made in five minutes, simply by opening or closing valves . . . all under one-man control.

Improve the standard of your coal, and gain the extra profits it will win for you. The Chance Process will help. Our engineers will be glad to cooperate with you in solving any coal-cleaning problems.

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*WITH A BACKGROUND OF OVER SIXTY YEARS' EXPERIENCE*

## Red Jacket Honors Union's Safety Helps

DISTRICT AND LOCAL UMWA OFFICIALS and members shared honors for improved safety in 1950 at the fifth annual Labor-Management Safety Dinner staged Feb. 17 by the Red Jacket Coal Corp., Red Jacket, Va.

In an exchange of compliments at the dinner, company officials and guests sounded the theme of cooperation in safety as follows:

J. J. Plasky, training and safety director for the company: "We all can increase our safety efforts and the benefits to us will increase proportionately."

Virgil Harvey, president, Coal Mountain Local, UMWA: "We will put forth our best efforts and cooperate 100%."

William Daugherty, president, Wyoming Local, UMWA. "You, the management, continue to preach safety, and we will continue to practice it."

W. H. Tomlinson, supervising engineer, USBM: "You have not left it up to others to reduce the accidents in your mines but have done the job by cooperation."

Paul D. Ritter, company president: "Whatever safety records our foremen have made were made possible by the crews who worked for them."

Charles Kiser, district representative, UMWA: "Instead of resting on our past laurels, which have been good, . . . there should be no let-up in safety if we want to make more progress."

William M. Ritter, general manager of the company: "It is a human-relations job to sell the 2,700 members of the Red Jacket family the idea of safety."

Tom Owens, president, Keen Mountain Local, UMWA: "Safety is like a tree. It must take root, and be nurtured, to grow."

Pictured at the head table at the banquet are: F. B. McChesney (left), company treasurer; J. J. Ardigo, secretary, Williamson Coal Operators' Association; C. H. Meadows, West Virginia Department of Mines; E. E. Quenon, USBM; R. A. Ison, assistant general manager of the company; A. U. Miller, USBM (retired); W. M. Ritter; Mr. Kiser, who was toastmaster; Mr. Plasky; Mr. Tomlinson; P. D. Ritter; Ransom Kirk and Gus Allison, field representatives, UMWA, and Young Lawson, West Virginia Department of Mines.

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mining engineer, division engineer and mine superintendent at various of the company's operations. Prior to his new appointment earlier this spring, he had been general superintendent of the Houston mines.

**Curtis O. Smith**, 58, chief electrician and part owner of the Premium Coal Co., Premium, Ky., died March 24 in a Harlan, Ky., hospital after a brief illness.

**William H. Lewis**, 63, operator of several mines in the vicinity of Hyden, Ky., died March 24 at his home in Hazard, Ky., following a sudden heart attack.

**William G. Sutton**, 81, owner of the Minonk No. 2 mine, Minonk, Ill., died March 20.

**Fred H. Johnston**, 72, vice president and director of the Goodman Mfg. Co., died March 19 at his home in Pompano Beach, Fla. Associated with the company for 46 yr, Mr. Johnston became secretary-treasurer in 1918 and had served as a director since 1921 and as a vice president since 1923. For many years he also served as vice president and director of the Superior Steel & Malleable Castings Co., Benton Harbor, Mich.

**D. F. McElhatten**, safety engineer, Peabody Coal Co., Marion, Ill., died April 12 following a heart attack while on an inspection tour of the company's Mine No. 8, Tovey, Ill.

**James G. Marks**, 73, died April 7 at his home in Easton, Md. Well known in western Pennsylvania coal fields, Mr. Marks was president of the Fancy Hill Coal Co. and a director of the Reliance Coal Mining Co. at his death and at one time was president of the Cosco Gas Coal Co.

# News In Brief

### Second Quarter Carloadings Up

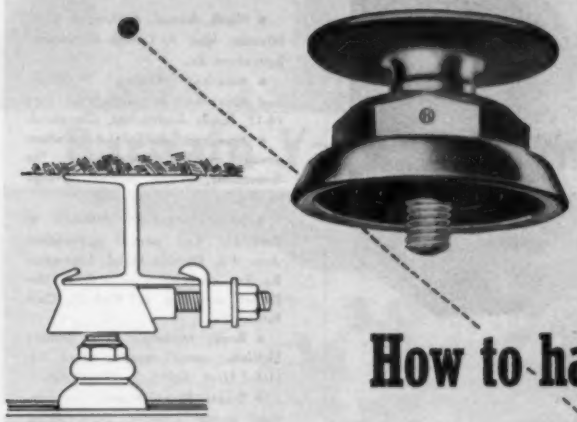
Freight carloadings in the second quarter of 1951 will exceed the same quarter of 1950 by 6.5%, according to estimates of the 13 Shippers' Advisory Boards. Coal and coke loading will rise an estimated 2.5%. Among the commodities which are expected to show the largest increases are: grain, 42.3%; machinery and boilers, 21.7%; ore and concentrates, 20.7%; brick and clay products, 13.2%. Anticipated carloading increases by region include: Northwest 23.8%; Great Lakes, 18.2%; Pacific Northwest, 10.1%; Central Western, 9%; Allegheny, 7.6%; Midwest, 7.4%; and New England 6.9%.

### Ill. Farmers Fight Stripping

Farmers in Knox County, Illinois, who oppose strip mining of farm lands, have contributed $5,000 toward a move to support a county zoning ordinance now being tested in court. Reportedly the first attempt in Illinois to control strip mining by county regulation, the ordinance is being challenged by coal companies as an invasion of property rights. The farmers maintain that stripping will leave the land almost worthless for farming and that the rich topsoil is more valuable for agricultural use than the coal mined.

### State Pricing of Gas Upheld

The power of the Oklahoma Corporation Committee to fix minimum prices for natural gas at the well head recently was upheld by the U. S. Supreme Court. Two bills reportedly before the Texas state legislature would permit the Texas regulatory body to set a minimum price of 10c per Mcf on gas at the well. The present average royalty, or price, in Texas is about 5c per Mcf, with the minimum running below 1c on the older contracts. Proponents of the bill say a minimum is necessary to conserve a valuable Texas asset and call the pipelines "a cancerous growth destroying the state."



**ROOF-TYPE HANGERS**

The Universal-2 Hanger shown and several like it can be attached directly to the roof, or can be attached to timbers by means of mine hanger screws.

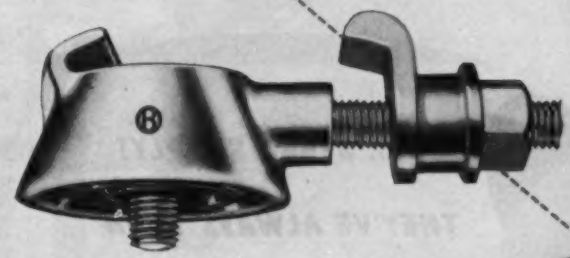
Cat. No. 11907

# How to hang a Wire—

**I-BEAM HANGERS**

Here's a good way to put a hanger on an I-Beam. The hanger shell is provided with an adjustable clamp which hooks over and tightens onto the flange. O-B Insulated I-Beam Hangers are made for flange widths ranging from 3 inches to 13½ inches.

3 to 5 inch flange. . Cat. No. 15391
5 to 8 inch flange. . Cat. No. 15803
8 to 13½ in. flange. . Cat. No. 20551



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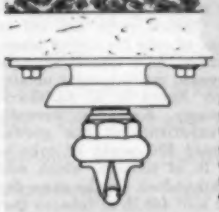

**TIMBER-TYPE HANGERS**

A couple of lag screws hold the Type-H hanger onto the timber. Side-mounting hangers for low vein mines and other locations where head room is limited are available also.

Cat. No. 1153

No matter how your mine roof is supported, there's an O-B method for attaching hangers either to the support or, if you wish, to the roof. Some are shown here. For each method there are several O-B hangers or combinations of hangers and accessories, one of which will make hanger attachment a simple matter in your mine.

In the O-B Mining Catalog you will find a wider selection of hangers. From this listing you can select a small group of hangers and accessories for use anywhere throughout your mine. Simplify your trolley installation, and your stock-keeping, with standard O-B hangers.

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UNITED STATES STEEL


## MEETINGS

- Ninth Annual Anthracite Conference: May 4, Lehigh University, Bethlehem, Pa.
- American Mining Congress: coal convention and exposition, May 14-17, Public Auditorium, Cleveland.
- American Coal Sales Association: annual meeting, May 17-19, The Greenbrier, White Sulphur Springs, W. Va.
- Mine Inspectors' Institute of America: 41st annual convention, June 4-6, Phoenix Hotel, Lexington, Ky. For information, write C. A. McDowell, secretary, 427 Park St., California, Pa.
- Rocky Mountain Coal Mining Institute: annual meeting, June 7-9, Hotel Utah, Salt Lake City, Utah.
- Stoker Manufacturers' Association: annual meeting, June 25-26, South Shore Inn, Lake Wawasee, Syracuse, Ind.

### Pa. Mine-Cave Control Sought

Re-establishment of the Pennsylvania State Anthracite Mine-Cave Commission was called for in a bill introduced into the House of Representatives late in March. The three-man commission, all to be residents of the anthracite region and one to be a practical mining engineer, would annually recommend to the governor such changes in the law thought necessary to "reduce the evils from mine caves or surface subsidiences." The bill also would require mine owners or operators to apply for a permit if operations might endanger existing mine supports or surface facilities. An appropriation of $250,000 was asked for the proposed commission.

### Coke-Cured Tobacco Pays Off

A better product and a corresponding higher market price has led to increased use of coke for curing tobacco in Kentucky. As a typical example of the increased market value obtainable, County Agent D. E. Salisbury, Clinton County, Kentucky, recently cited the experience of one grower who consumed $20 worth of coke to cure 4,110 lb of tobacco, which sold for $58.50 a hundred. On the same day the grower sold 440 lb of tobacco that was not heat-cured, at an average of $42 a hundred.

### Buffalo Schools View Coal Use

The possibility of converting Buffalo's public schools from coal to automatic oil or gas heat will be studied by the superintendent of schools under a recent authorization of the Board of Education. The study was suggested by Board President Wallace C. Miller, who said: "What with price increases and the overhead cost in-

# Bargain Yardage with This Team

BIG yardage at low cost is the bargain delivered by this hard-working "Big Red" team — International TD-24 crawler tractor and Bucyrus-Erie Bullgrader or bulldozer. That's because addition of this blade equipment leaves tractor balance point virtually unchanged . . . full tractive effort is available for the tough jobs. Scientifically curved blade keeps the load "live" . . . keeps it rolling to move greater yardage per horsepower. Full visibility and ease of control make it easy for the operator to see exactly what his blade is doing, to work at top efficiency without fatigue. Control levers are quickly responsive, easy to handle, positioned for greatest convenience. Bucyrus-Erie's balanced design means less tractor wear, too, while quality construction of top-grade steels and alloys add to long, profitable machine life. See your International Industrial Tractor distributor for complete details.

230750

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

SOLVES THERMAL DRYING'S MOST DIFFICULT PROBLEM
IN THE ¾"x0 RANGE

McNALLY PULSO DRYER
ALL NEW AND PROVEN DRYER

NO DUST
NO DEGRADATION
NO AIR POLLUTION
...When Drying Fines

*Yes...* *For the 1st time!* **Fine Coal Drying...No Degradation No Dust...NO AIR POLLUTION**

Yes, we mean *NO dust... NO air pollution!...* and no loss of coal tonnage due to degradation. In a plant near Seattle, Washington, where the Pulso Dryer was put in production when snow was on the ground, there was no "black snow" around the plant due to dust precipitation.

Surface moisture can be controlled to suit your market requirement. The fine coal finished product is as dry as tinder . . . and ton for ton of coal fed in.

No recirculation of fine coal, no degradation, and no more dust than is in the fine coal feed.

**2 FANS . . . A DESIGN FEATURE, FOR THE FIRST TIME PERMITTING BALANCED DRAFT DRYING**

In the above illustration the cut-away sections are intended to give you a full view of what goes on in the McNally Pulso Dryer which is built to dry the hardest fractions from ¾ inch to zero. Moisture is evaporated 100% without a drop of effluent.

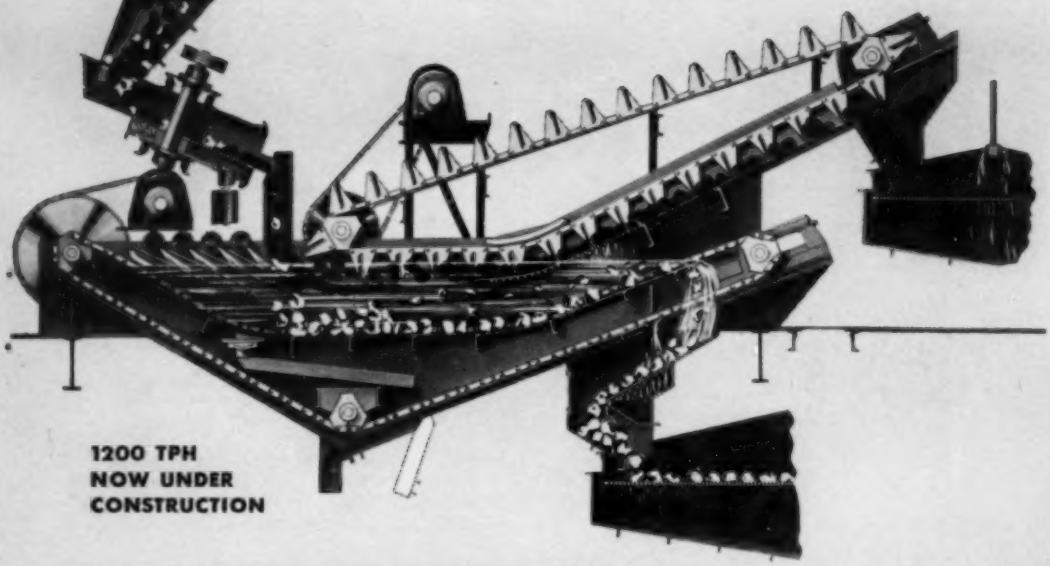
It is available in tonnage capacities to meet your needs. Let us demonstrate the Pulso Dryer to you.

**McNALLY PITTSBURG MFG. CORP.**

*Manufacturing Plants:* Pittsburg, Kansas • Wellston, Ohio
Engineering and Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

THE McNALLY
SHOW
FOR 1951
McNALLY PITTSBURG
Turn this page...
Pull up a chair...
and LOOK!
See how

# McNALLY TROMP HEAVY MEDIA BAT



1200 TPH
NOW UNDER
CONSTRUCTION

# 2 New Washers—

## TESTED AND PROVED

*Now!* **You can wash large lump down to ¼" at LABORATORY EFFICIENCY**

The Tromp Bath is a thoroughly proved and efficient system for cleaning the more difficult low-gravity coals and the extremely high-gravity coals.

### PATENTED LAMINAR FLOW

The Tromp employs the patented Laminar flow principle and utilizes coarse ground magnetite, mill scale, limestone, or other heavy media specific gravity particles which may or may not be recovered by magnetic principle.

The coal enters the bath at a controlled rate of discharge from the raw coal conveyor. It moves continuously and slowly through the bath and by flotation the coal rises. Coal, clean coal conveyor, middle gravity particles, dense media solution, and sink conveyor move at the same speed through the bath from raw coal inlet towards the discharge end. Clean coal is discharged to rinsing screens while middlings, transported by Laminar flow solution, are intercepted by refuse conveyor near refuse discharge point. They are then discharged along with refuse to the refuse rinsing screens. A high accumulation of middle gravity particles will not hamper the efficiency of the McNally Tromp Dense Media Bath since they are continuously removed from the bath proper.

### LATEST McNALLY WASHING SYSTEM

The McNally Tromp Heavy Media Bath is the latest washing system added to the McNally line, which consists of the McNally Norton baum jig, Rheolaveur coarse and fine coal cleaners, McNally Menzies Cone, and the Brusset Vacuum jig dry cleaning system. The Tromp Heavy Media Bath has long been in use in England, France, and Holland. Therefore, it is not an experimental system that is in the pilot stage of development.

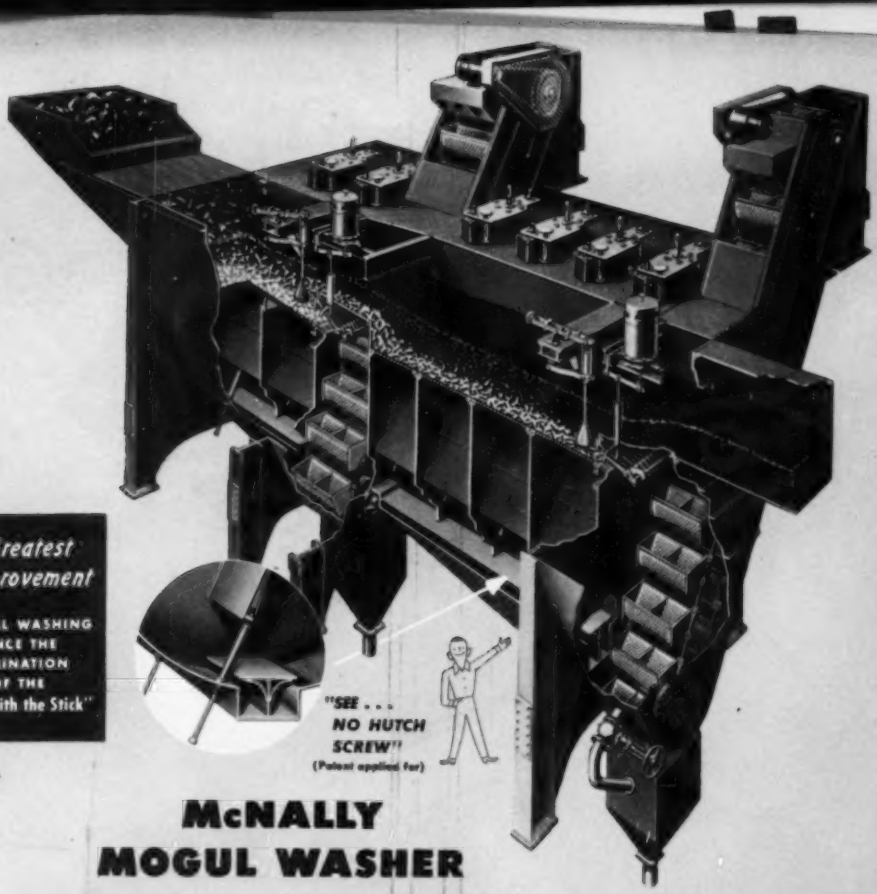
### NOW NEARING COMPLETION

In Illinois a large plant processing 800 TPH is now nearing completion and another 350 TPH plant is starting under construction in Eastern Kentucky.

Investigate its possibilities for cleaning your coal. We will gladly explain its advantages and give you an actual forecast of operating results.

**LOOK TO McNALLY PITTSBURG FOR THE NEW DEVELOPME**

ATH




*The Greatest Improvement*

IN COAL WASHING SINCE THE ELIMINATION OF THE "Man with the Stick"

# McNALLY MOGUL WASHER

# IN ACTUAL SERVICE!

*At last!* **Increased tonnage without extra shifts or WITHOUT MORE MAN POWER**

The McNally Mogul Washer employs the baum jig principle used so successfully during the last two decades. It washes mixed sizes by making clean cut separation of coal from refuse.

## SUPER CAPACITY WASHER

Produces greater tonnages than possible before in a single unit.

Raw coal is cleaned in two stages. Primary stage removes heavier refuse material. Secondary compartment separates coal into a bottom layer of middlings and a higher level layer of pure coal. Patented finger gate separates the layers discharging pure coal into the final delivery circuit. Middlings are discharged separately for refuse or reprocessing. Refuse gate cannot jam, making it possible to wash a complete range of sizes up to 8 inch. Specific gravity can be changed at will.

## LATEST IMPROVED DESIGN FEATURES

*Hutch screw eliminated.* Note particularly this feature at the bottom of the washing cells. Maintenance eliminated on hutch screws.

*Improved impulse control valve* permitting greater sensitivity of adjustment.

*Submerged Air Valve Exhaust.* Lowers obstruction at floor level. Eliminates forming of mess on top of washer.

## NOW IN ACTUAL OPERATION

McNally Mogul Washers are demonstrating their ability in plants in Northern Illinois and Ohio where the raw coal comes from the more difficult seams and where there is a high percentage of heavy-gravity material.

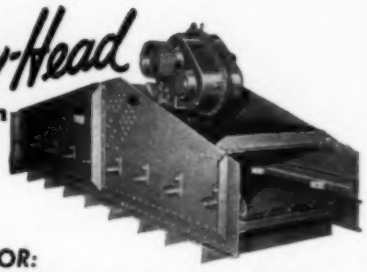
See us at Booth 1601
Mining Congress Exhibit
Cleveland, Ohio

DEMONSTRATIONS CAN BE ARRANGED AT PLANTS ALREADY IN PRODUCTION

MENTS IN *Coal Cleaning Equipment*

# ANY coal screen need can be met with these three screens

## Low-Head Screen



### USED FOR:

- Primary dewatering of coarse coal following washers.
- Primary and secondary dewatering of small coal.
- Sludge dewatering.
- Desliming ahead of centrifugal dryers.
- Pre-wetting ahead of Heavy-Media Separators.
- Draining and washing media from coal and refuse following Heavy-Media Separators.
- Dewatering washer refuse.
- Dewatering and sizing middlings.
- Water clarification and recovery of salable sludge.

*Low-Head* vibrating screens operate horizontally — save headroom and installation costs. Straight-line vibrating motion at 45° to the horizontal results in a definite conveying action and rapid stratification. Sizes 3 x 6 to 6 x 16 ft. Send for **Bulletin 07B6330A.**

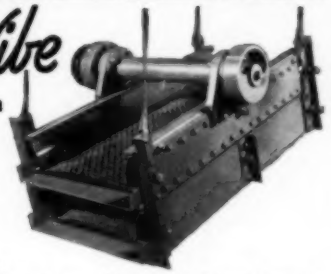
## Ripl-Flo Screen

### USED FOR:

- Scalping ROM ahead of picking tables or crushers. (Extra Heavy Duty *Ripl-Flo* screen)
- Sizing raw coal ahead of washers or dry cleaners.
- Sizing and re-screening crushed coal into egg, range, nut and stoker grades, with 2, 3 or 4 separations.
- Primary dewatering of coarse coal following washers.
- Dewatering washer refuse.
- Dewatering and sizing middlings.
- Dry screening medium size moist coal. (*Sta-Kleen* deck)
- Dry screening small size moist coal. ("Tri-Slope" *Sta-Kleen* deck)

*Ripl-Flo* vibrating screens are built with only two bearings instead of four. Width is reduced 17%; weight by as much as 36% — low maintenance and power costs. Convenient clamping plates make it easy to change or tension screen cloth. Sizes 3 x 6 to 6 x 16 ft. **Bulletin 07B6151B.**

## Aero-Vibe Screen



### USED FOR:

- Sizing raw coal ahead of air cleaner.
- Dedusting.
- Dewatering sludge.
- Sizing middlings from dry cleaner.
- Dewatering coal following chloride washer.

*Aero-Vibe* screens, for fine to medium sizing, wet or dry, are easy to install and operate, require little maintenance. Amplitude of vibration can be changed by adjusting outer counterweights on each side of two-bearing concentric shaft. Sizes 2 x 4 to 5 x 10 ft. **Bulletin 07B6099.**

*Your nearby A-C representative will be glad to show you how these coal screens can save money in your plant. Allis-Chalmers, Milwaukee 1, Wis.*

# ALLIS-CHALMERS

A-3285

Texrope, Low-Head, Ripl-Flo, Aero-Vibe and Sta-Kleen are Allis-Chalmers trademarks.

**Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.**

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Controls

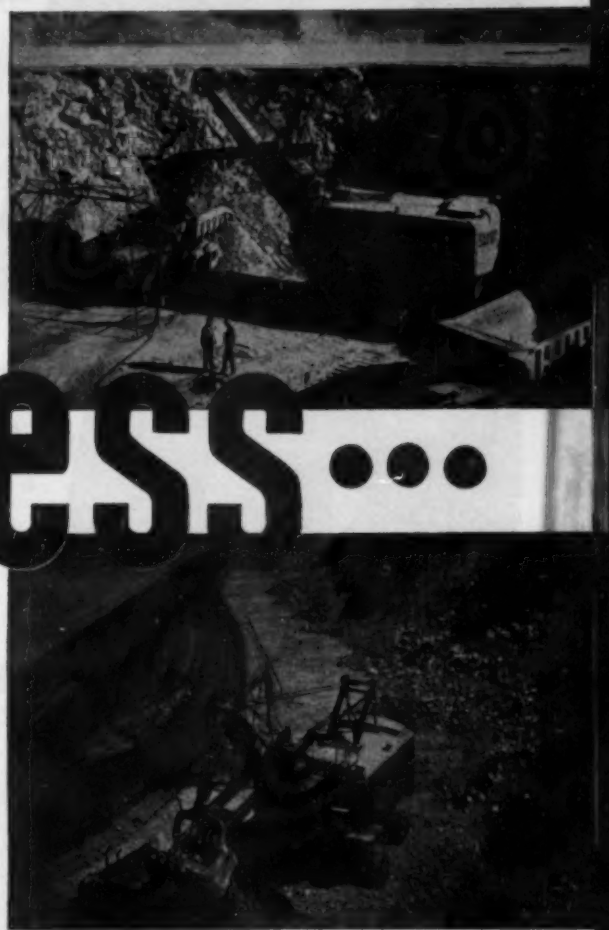
Texrope Drives

Vibrating Screens

Jaw Crushers

Kilns, Coolers, Dryers

# you can't beat progress...



## ELECTRIC P&H SHOVELS

All the advancements in electrical digging made by P&H have one common purpose — *lower tonnage costs.*

Here's *faster operation* with such P&H improvements as Magnetorque* Hoist Drive, stepless power regulation . . . independent propel for faster move-ups.

Here's *steadier digging* — many of the old mechanical devices which caused trouble and delay are eliminated — no slip friction clutches; no sliding gears to shift, no electrical contactors in main control system.

Here's *lower maintenance cost* — all-welded construction originated by P&H — induction-hardened gearing — filtered air cab.

When you put these, and other progressive P&H ideas to work, you're sure of lower tonnage costs in all kinds of open-pit operations.

*P&H leads the field in electric shovel developments.*

*T. M. of Harnischfeger Corporation for electro-magnetic type clutch.

These two 4-yd. electric shovels have played a big part in the successful change to open pit mining at Inspiration Consolidated Copper Mines at Inspiration, Arizona. A third P&H will provide increased production to meet the growing need for copper.

P&H **ELECTRIC SHOVELS**
4549 W. National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

*Every third P&H Electric Shovel sold is a repeat order*

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • CRAWLER AND TRUCK CRANES • DIESEL ENGINES • CANE LOADERS • PRE-ASSEMBLED HOMES

# PARIS MANUFACTURING COMPANY

## *Announces*

# THREE *NEW* DRILLS

The PARMANCO Coal Drill will drill 2½ inch holes at a speed of up to six feet per minute in #5 coal. Equipped with heavy duty truck-type transmission and rear end and a complete hydraulic feed, the drill is operated by one man from the control seat. It is made in two sizes with a 12 h.p. or 25 h.p. gas motor and all units are completely self-contained and enclosed in oil-tight cases.

***ALREADY USED by***

| | | | |
|---|---|---|---|
| Big Seam Collieries, Inc. | 1 | Knox Coal Co. | 1 |
| United Electric Coal Co. | 6 | Southwestern Ill. Coal Co. | 1 |
| Fairview Collieries Corp. | 2 | Truax-Traer Coal Company | 7 |
| Colonial Coal Co. | 1 | Refractory Field | |
| Little Sister Coal Co. | 1 | Harbison-Walker Refractories Co. | 1 |
| Nuno-Sinclair Coal Mining Co. | 6 | Mexico Refractories Co. | 1 |
| Sherwood-Tompkins Coal Co. | 1 | A. P. Green Fire Brick Co. | 1 |

***THIS UNIT IS DELIVERING 6-INCH SHOT HOLES — READY FOR LOADING at Better Than Two Feet a Minute ! ! !***

The new PARMANCO Hi-Speed Horizontal Drill is completely redesigned around a 40 h.p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time —a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

**PARIS**
MANUFACTURING
COMPANY
Paris, Illinois

### EQUIPMENT APPROVALS

Five approvals of permissible equipment were reported by the U. S. Bureau of Mines in March, as follows:

Jeffrey Mfg. Co.—Type 70UR universal cutting machine; two motors, 25 and 50 hp, 500 v, DC; Approval 2-724A; March 23.

Joy Mfg. Co.—Type WL80B Model 50 air compressor; one 50-hp motor, 250 v, DC; Approval 2-779; March 2.

Joy Mfg. Co.—Type T1C-3PE/F mining-machine truck; two 4-hp motors, 250 and 500 v, DC; Approvals 2-780 and 2-780A; March 20.

Ensign Electric & Mfg. Co.—Bulletin 5412 pump; one 40-hp motor, 440 v, AC; Approval 2-781A; March 21.

Joy Mfg. Co.—Type T2C-6APE/F mining-machine truck; two 4-hp motors, 250 and 500 v, DC; Approvals 2-782 and 2-782A; March 30.

volved in the use of coal, I think we should look into this matter very seriously." In using coal, the department must employ coal passers, inspectors and other personnel and must also periodically buy thousands of ash cans, he said.

### Company Earning Reports

**Stonega Coke & Coal Co.**—1950 net income, $629,292, equal to $6.29 a common share, on operating revenues of $15,160,571; compared with a 1949 net of $337,611, or $3.38 a share, on sales of $12,140,315.

**Pittston Co. and subsidiaries**—1950 net income of $1,886,338, or $3.10 a share, on sales of $76,159,126; compared to 1949 net of $1,366,947, or $2.25 a share, on sales of $71,725,218.

**Westmoreland Coal Co.**—1950 net profit of $747,506, equal to $4.98 a share, compared with the 1949 net of $605,476, or $4.05 a share. Total coal mined was 1,285,330 tons, an increase of 38.1% over 1949.

**Westmoreland, Inc.**—1950 net profit of $168,713, or $1.10 a share, compared with $161,315, or $1.01 a share, in 1949.

**Franklin County Coal Corp.**—For 1950, net loss of $91,236 on coal sales of $4,208,948, against a loss of $160,776 on sales of $3,857,854 in 1949.

**Goodman Mfg. Co.**—1950 net income of $645,673, equal to $5.38 a share, on net sales of $13,192,716, compared with a 1949 net of $770,369, or $6.88 a share, on sales of $15,116,924.

### Push Summer Anthracite Sales

With the usual spring and summer price cuts going into effect last month,

and they're the only ones that do!

Here's the biggest improvement in grab and slip hooks since they were invented — the *exclusive* Laughlin clevis feature that has made an instant hit with users everywhere!

**Quick-fastening.** Just slip the pin through the clevis and chain, spread the cotter — and they're ready to go to work!

**Work-saving.** No shackling or cold-shutting — no cutting, bending or rewelding of the chain.

**Stronger and safer.** Heat-treated and drop-forged for tops in ruggedness — and the forged housings protect workers' hands from injury.

**THEY PAY FOR THEMSELVES**

Every replacement of an old-style grab or slip hook with a Laughlin Clevis means time, trouble and money saved. That's why a complete changeover to these efficiency-boosters is one of the soundest investments you can make in over-all economy . . . Order Laughlin Clevis Grab and Slip Hooks from your mine, mill or oil field supply house.

**Free!** Catalog-Data Book tells you how to select the *right* wire rope or chain fitting for every job. Use the coupon below.

SEND IN TODAY ... no cost or obligation

THE THOMAS LAUGHLIN COMPANY
75 Fore St., Portland 6, Maine
Please send Catalog-Data Book #150 to:

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*Company*.....
*Street*.....
*City*.....*Zone*.....*State*.....

**LAUGHLIN**

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

*Meeting Modern demands for*

# better production methods

1 *From mines to washing plant*
2 *After cleaning*
3 *weighing rejects and in*

**BLENDING**

*and in*

**CHECKING TONNAGE PAYMENTS**

*Modern Mines use the*

## WEIGHTOMETER

All these things a WEIGHTOMETER* will do in your cleaning plant add up to LOWER COST PRODUCTION. Leading producers use WEIGHTOMETERS for accurate, speedy WEIGHING WHILE CONVEYING, without interruption to conveyor service. Applicable to existing belt conveyors or furnished complete with short conveyor. Graphs of hourly or daily tonnage, carried continuously or intermittently, produced at your desk if desired. Moving loads of coal weighed and recorded on belt conveyors underground, up a slope, or near the tipple. Write today for Bulletin 375 for further details.

● **AND THERE'S ALSO THE *FEEDOWEIGHT* . . .**

The FEEDOWEIGHT* gives you absolute control in BLENDING and MIXING coal, plus accurate continuous weight totalizing in the same operation. It's just a matter of automatically controlling EACH FEED GATE by WEIGHT without retarding the scale beam. Write today for Catalog No. 551 to find out how one or more of these units can most effectively and economically be used in your cleaning plant.

* Reg. U.S. Pat. Off.

MERRICK SCALE MFG. CO.
173 Summer St., PASSAIC, NEW JERSEY


the large anthracite producers have launched large-scale promotional campaigns to encourage dealers and customers to stock up before the anticipated rail tie-ups occur this fall. It is understood that a government-sponsored campaign will be started soon to back up the producers and it is hoped that the program will eliminate seasonable mine layoffs. Mine operators are using newspapers, radio and television to put the case for summer buying before consumers.

### Senate Bill to Give Bureau Police Power in Coal Mines

A bill authorizing the U. S. Bureau of Mines to draft safety regulations for coal mines throughout the country was introduced into the Senate April 11 by Sen. Neely (D., W. Va.). The measure, which is identical to the one approved by the Senate Labor Committee last year, would empower federal coal mine inspectors to shut down sections of mines where they find violations of the regulations create danger.

### Freight-Car Shortage to Grow

"Freight car shortages during 1951 will surpass in severity those which we experienced during World War II and in the post-war period," James K. Knudson, chief of the Defense Transport Administration, said in recent hearings before a House Appropriations Committee which were made public April 11. The 1951 car supply will fall "far short" of meeting demands, and the answer is to build and put in operation 300,000 new freight cars, he said. In 1951 the railroads must haul some 687 billion revenue ton-miles, compared with about 587 billion in 1950 and the World War II's peak year of 737 billion, he estimated. While the government's program had called for allocation of steel to permit the building of 10,000 new freight cars a month beginning in January, actual construction had fallen about 50% short of the goal in January and was still some 30% short in March, another DTA official said.

### Government Appeal Denied In UMWA-Contempt Case

The government's appeal from the lower court's decision that the UMWA was not guilty of civil contempt during the 1950 coal strike was denied April 12 by the U. S. Court of Appeals for the District of Columbia. By a 2 to 1 decision, the court dismissed the appeal as moot since "the ultimate objectives of both the restraining order and of the civil contempt proceeding had, pending appeal, eventuated" and reversal of the lower court would be futile. In presenting its appeal, the government had asked the court to rule that mass action by union members in disregard of a court order is punishable by contempt

YOUR COAL CAN BRING

# PREMIUM PRICES

WITH

# MOBIL-MILL

## PRECISION CLEANING!

Your **entire** coal output—the full range of sizes and grades to 3/32"—can be marketed at premium prices if you employ the **precision cleaning** of WEMCO HMS MOBIL-MILLS. Field reports continue to prove the flexibility, accuracy and efficiency of these modern coal cleaning plants. Typical of these reports is the case of a West Virginia operator who recently converted to a Mobil-Mill.

Operating 3 shifts per day at 143% of rated TPH capacity with feed size 2" x 3/16" and gravity of 1.49-1.51, this complete washing plant produces cleaned coal of only **3.3%** ash from a feed containing 15% ash. With only one operator per shift and magnetite losses between 0.5 and 0.7 pounds per ton feed, this operator claims his Mobil-Mill is **"the most efficient cleaning plant he has ever seen in 30 years of experience."**

Check these **MOBIL-MILL FEATURES**

- ✓ Prefabricated
- ✓ Low initial cost
- ✓ Low operating costs
- ✓ Clean, sharp separations
- ✓ Installed for you

***Write today for complete information on how a Mobil-Mill can help you get premium prices for your coal.***

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**WESTERN MACHINERY COMPANY**

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| CONE SEPARATORS | | CONDITIONERS |
| DRUM SEPARATORS | | |

For Maximum
SAFETY!
SPEED!
DEPENDABILITY!

I'll Take...

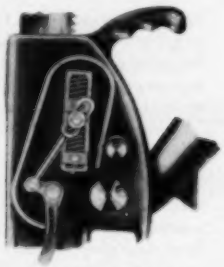
DUFF-NORTON Mine JACKS

No. 514-MT for THIN SEAMS

No. 516-MT for MEDIUM SEAMS

No. 521-MT for THICK SEAMS

The three Duff-Norton Jacks illustrated simplify selection of jacks for thin, medium and thick seam mines. All are of five ton capacity . . . the 514-MT is 14" high with a 7½"lift . . . the 516-MT is 16" high with a 9½" lift . . . and the 521-MT is 21" high with a 14½" lift. These jacks perform every lifting and lowering job with ease. For quotation, specify jacks by number.



STURDY SPRING

This world-famous patented spring mechanism is an adjustable, self-contained unit, that assures positive pawl action. Jacks cannot be tripped under load, safeguarding men and equipment.

*Write today for the*
"HANDY MINE JACK GUIDE"

Visit our
Booth 1901
at the Coal Show.

DUFF-NORTON JACKS
STRENGTH SAFETY DEPENDABILITY
ESTABLISHED 1883

THE DUFF-NORTON MANUFACTURING CO.
MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA. — CANADIAN PLANT, TORONTO 6, ONT.

*"The House that Jacks Built"*


action against the union even though union officers apparently had complied with the order.

### Operators Fight Tenn. Code

The constitutionality of Tennessee's new mining code is being contested in a suit brought April 4 in the Davidson County Chancery Court by various coal companies who are members of the Southern Appalachian Coal Operators' Association. The suit names as defendants James L. Case, state labor commissioner; J. A. Welch, chief mine inspector; and Roy H. Beeler, attorney general. It asks for a temporary injunction to prevent enforcement of the new code.

### And for Your Information . . .

**The "Head-of-the-Lakes"** shipping season opened April 11, some 3 wk ahead of the 1950 opening on May 1.

**Coal-carrying trucks** of one company have caused $35,000 damage to secondary roads in Harrison County, West Virginia, or $28,000 more than normal maintenance would require, a State Road Commission engineer testified last month. The Commission is seeking payment from the C. & C. Coal Co., Lumberport, under a state law that permits it to recover for more than normal maintenance costs. The coal company maintained that the reported damage was caused by independent truckers hauling its coal.

**Property owners in Westchester County,** New York, last month asked the state Public Service Commission to take jurisdiction over existing and projected natural-gas pipelines and to insure their safety. The petition quoted a report based on data from the FPC that showed 42 cases of breaks in interstate pipelines in the last 4 yr, which were accompanied by fires, injuries and deaths.

**A 10-man team of German coal-mine management,** engineering and labor representatives arrived in the U. S. April 17 for a 38-day tour of the American industry under ECA auspices.

**Its second annual Strip Pit Fishing Contest** has just been announced by the Missouri Coal Operators' Association. Success of last year's contest was responsible for the decision to again offer awards for the largest fish of specified types caught in coal strip-pit waters in Missouri, Tom Cheasley, secretary of the association, reported. Entry blanks and rules may be secured from Mr. Cheasley, who is assistant to the president of the Sinclair Coal Co.

**Under a revised lease form** and amended regulations approved recently by the Secretary of the Interior, producers who take coal from public lands are required to restore the surface of the land and take reasonable steps to prevent water pollution.

# FOUR MILLION TONS OF COAL CRUSHED

## with a parts replacement cost of only $.0005 per ton

**AMERICAN AC3-E CRUSHER**
**in continuous service for 10 years**
**reduces 300 TPH 6" x 1¼" washed coal to 100% passing 1¼" screen**

### AT THE LITTLE SISTER COAL CORPORATION (St. David, Ill.)

**. . . this crusher is giving a performance that is typically American—*typical* because American Crushers are engineered to "take it," and are *tested in actual use*. They slash power and labor costs too, and cut out-of-service time to a minimum. *Here are a few construction "whys" behind American records—***

**THE HEAT TREATED ALLOY STEEL MAIN ROTOR SHAFT**—revolves on heavy duty Timken Bearings enclosed in dust and oil-tight pillow blocks. *Perfect balance eliminates vibration.*

**THE HEAVY RIBBED SECTIONAL FRAME**—Cast Steel—permits *accessibility* and *adjustability* . . . bearing pedestals are cast integral with side frames to assure rigidity.

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**REVERSIBLE SHREDDER RINGS**
In reducing coal by *controlled cleavage* (instead of by crushing), these 20-edge manganese steel rings give uniform, high tonnage reduction, with a minimum of degradation, operating at slow (275 to 350 RPM) power-saving speeds.

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- **Permissible Tramdrills for single or double arm operation**
- **Electric Roof Bolting Units drill bolt holes and run nuts**
- **Permissible Post-Mounted and Hand-Held Drills—the world's largest line**

- **Air-Driven Roof Bolting Impact Wrenches run nuts and bolts to 1¼" bolt size**
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In an Illinois mine TDD DOUBLE ARM TRAM-DRILLS are working sixteen places per shift, drilling eighteen 3½" diameter, 8-foot holes per place. Averaging 250 holes per shift, they sometimes drill over 300 holes.

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# PRODUCTION
## *Exposition*

Roof Bolting Unit drills hole for suspension roof bolt

Roof Bolting Unit tightens nut on roof bolt

CP-3630-RPSH
Impact Wrench handles
nuts to ¾" bolt size

CP-365-RPSH
Impact Wrench handles
nuts to 1¼" bolt size

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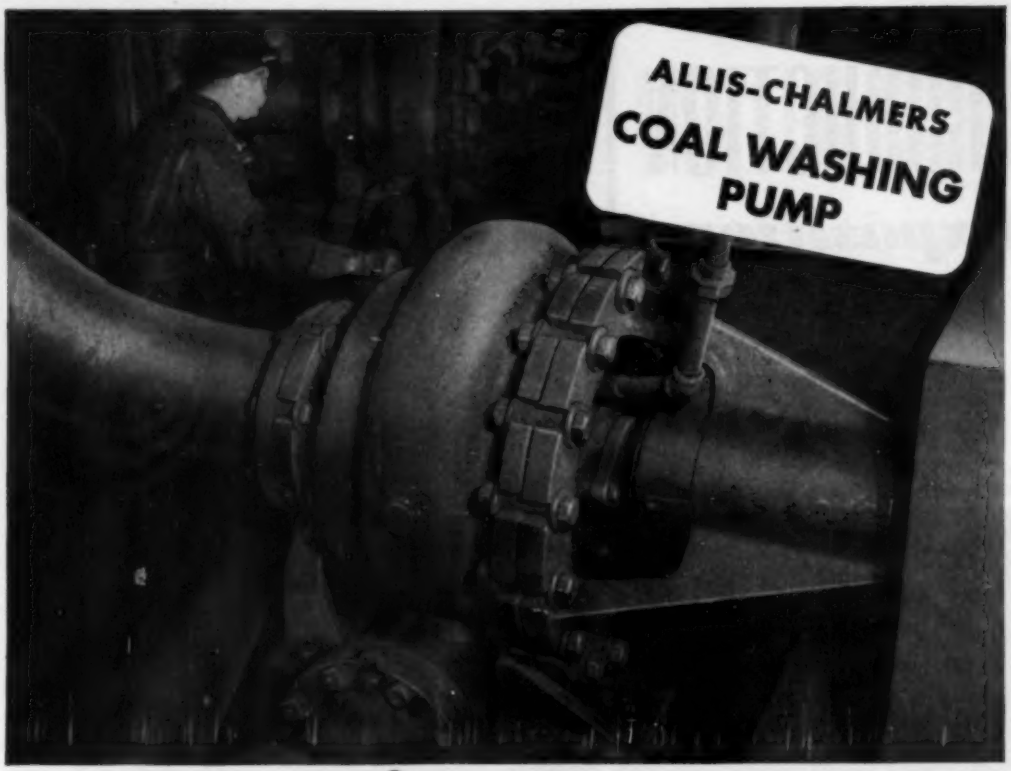


# Operating Economy Brings Repeat Order

WHEN WEST KENTUCKY COAL COMPANY built a new preparation plant at their Pleasant View Mine, they chose Allis-Chalmers CW (Coal Washing) pumps. Why? Because three years of experience with these pumps at their East Diamond preparation plant had shown them how low operating costs are with Allis-Chalmers CW pumps.

### Long Life Between Servicings

Users report up to four times longer life with Allis-Chalmers CW pumps because they are made of special hard *Allisite* alloy . . . because they have thicker sections and heavier parts . . . and because they are application engineered by specialists who know how to solve coal washing problems.

### Replace Worn Parts In Half Hour

When worn parts must be replaced, the CW pump can be dismantled, an element replaced, and put back into service in less than a half hour. There are only five wearing parts, each made for easy handling and replacement. Piping need not be disturbed unless the casing is to be replaced.

Discuss your coal washing equipment problems with an A-C pump engineer. Call your nearest Sales Office or write Allis-Chalmers, Milwaukee 1, Wisconsin for Bulletin 08B6381.

**ONLY FIVE WEARING PARTS**

Shaft sleeve, impeller, casing, two wear plates. All easy to handle and easy to replace.

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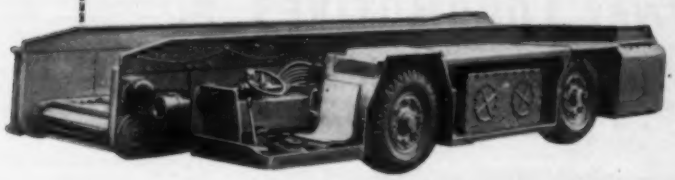

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**It's tougher to cut!**
**It's tougher to crush!**
**It's tougher to abrade!**
**It's tougher to break!**
**It's tougher to permeate with water!**
**It's tougher to fatigue from repeated short radius bending!**

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*amazing* new
Inflatable
Brattice
for cross cut stoppings

BOOTH 1105
COAL SHOW
CLEVELAND
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AMERICAN
BRATTICE CLOTH CORP.
WARSAW, INDIANA

## COAL MEN ON THE JOB

COAL DIVISION, EG&FA—general and mine superintendents assembled for a recent conference included: W. W. Hunter (left, front row), W. J. B. Mayo, S. H. Thatcher and W. D. Hawley, general superintendents. Mine superintendents: J. R. Irvin (second row), Sonman; C. A. Perdue, Keystone; A. V. Faull, Eccles; U. A. Cobb, Wharton No. 2; J. S. Wells, Wharton No. 1; and E. B. Taylor, Maitland. E. W. Potter (third row), Powellton No. 6; G. D. Wilders, Melcroft; C. O. Carman, Stotesbury; J. H. Benedict, Helen; Otto Heyer, Federal No. 1; and Felix Schleenvoight, Beards Fork. C. J. Kirby (fourth row), Page; Cleophus Short, Kopperston; H. W. Moore, Powellton No. 3; E. H. Shaw, Carswell; and V. A. Hensley, Weeksbury.

**More Coal Men Photos on Pages 178, 182, 196, 206 and 216**

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*STORAGE BATTERY* LOCOMOTIVES

*are more efficient than any other . . S-B Locomotive*

TYPE - F

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26" - HIGH

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*Complete details and specifications on request.*

THE ATLAS CAR & MFG. CO.

## ICC URGED to Hold Regional Hearings on Rail Hike

Speaking for bituminous coal producers throughout the entire country, the National Coal Association, April 3 asked the Interstate Commerce Commission to defer further hearings on increased railroad freight rates for at least 90 days, and also to hold regional or field hearings, in addition to hearings at Washington, to give shippers better opportunity to present their evidence.

The request was made in a letter to the ICC in reply to the petition filed by the railroads March 28, seeking increases generally of 15% in present freight charges, including increases ranging up to 50c a ton on coal. The commission March 14 granted temporary increases of 2 to 4 % in rail freight charges.

Also joining in the effort to delay hearings, the Property Owners' Committee, representing shippers of some 100 million tons of bituminous coal annually, filed a similar letter with the ICC.

On April 6 the railroads filed a letter with the ICC answering the two requests for delayed hearings. The letter made no attempt to discuss the statistics cited by the NCA and POC but continued to maintain that they were suffering irretrievable losses and urged the commission to set hearings as early as possible.

The NCA's letter focused attention

# Be Sure to See

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at the Coal Show May 14-17

You'll want to see the new Euclid twin-powered scraper and other "Eucs" for coal, overburden and gob hauling that will be on display at the Coal Show.

And while you are in Cleveland we hope that you'll give us an opportunity to show you the modern new factory where Euclid equipment is built. Just drop in at our exhibit and we'll arrange a plant trip at your convenience.

We are looking forward to seeing you in Cleveland and hope you'll put Euclid Hea quarters on your "must" list for the Coal Show.

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The design of the mounting brackets on either side of the engine frame makes your tractor engine easily accessible for inspection and adjustment.

With a new *engine-mounted* BAKER Bulldozer or Grade-builder on your *new* and more powerful ALLIS-CHALMERS Tractor, driver fatigue—and loss in accuracy and production—is reduced to a new low.

The operator can control the blade with his forearm resting on the seat arm. The control valve is equipped with ball bearings—needs only *finger-tip* effort to shift. And due to the exclusive BAKER valve system, you can count on your blade to *hold* in any position.

For the complete story on how BAKER blades can help you do more work and better work on every shift, see your Baker, Allis-Chalmers Dealer or write direct for Bulletin 894. THE BAKER MANUFACTURING COMPANY, Springfield, Illinois.

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on the fact that traffic and passenger volume and railway income in January and February this year far exceed the estimates made by the railroads, and said that this upward trend will continue, and in all probability, accelerate, during the remainder of 1951. The carriers had underestimated 1951 revenues by at least $273 million, which is almost identical with the added expenses claimed by the railroads, which were not considered by the ICC in its interim decision, the NCA maintained. The railroads had estimated that revenues from passenger, mail and express service during the entire year 1951 would exceed that of 1950 by only $18 million. The NCA pointed out that revenue from these sources increased $19 million in one month alone, January, over the same month of 1950.

It also emphasized that fuel coal bought by the railroads in February cost only 3c per ton more than that purchased in January, although there was a wage increase to the coal miners Feb. 1. When allowances are made for technological changes, unit costs of fuel have actually decreased, it said.

With respect to the railroads' position that their increased taxes is a partial basis for increased freight rates, the NCA stated: "In short, the carriers contemplate passing all increased taxes, and then some, on to the consumers, which was most assuredly not the intent of Congress in raising corporate taxes. If all increases were to be passed on to consumers, all new taxes would have been applied to personal income or sales taxes." The association points out that each segment of our national economy should share the tax burden.

In requesting the deferred hearing, the letter states: "No amount of present speculation or conjecture, however documented, can possibly sustain any further increase beyond that already granted by the commission. Sufficient time should be allowed for protestants to explore thoroughly the carriers' estimates of revenues and expenses and to test them on the basis of the results shown by the operating statements of the first 6 mo of 1951."

## Residual Fuel Oil Upgrading Suggested

More research should be directed toward upgrading residual fuel oil, emphasizes Joseph Pursglove Jr., vice president, research and development, Pittsburgh Consolidation Coal Co., in in a letter to *Coal Age*, in which he says:

"In the last *Coal Age* I noticed that it said the National Coal Council had recommended at some time past that the government build synthetic-fuel plants.

"As a member of the Synthetic Fuel Committee of the National Coal Council I am quite certain that this statement is incorrect because such a rec-

# Moore Body Company "ARMORS" Truck-Bed Bottoms with J&L Jalloy Heat-Treated Plate

**J&L STEEL**

## Impact- and Abrasion-Resistant Jalloy Plates Increase Service Life . . . Cut Deadweight of Moore Truck Bodies

The Moore Body Company of Reading, Pa., builds truck bodies for the mining industry where equipment really takes a beating. Moore has standardized on J&L Jalloy heat-treated plate to "armor" its truck-body bottoms against impact and abrasion.

The reason:—J&L Jalloy has a yield strength and Brinell hardness four times as great as mild steel. This makes it possible to cut deadweight by reducing plate thickness, and at the same time increase service life through Jalloy's high strength and wearing qualities.

For example, in Moore Body Company's 9 cu. yd. stripping body, 3/16" Jalloy has replaced 1/4" mild steel, and yet Jalloy's strength and hardness ensure increased resistance to abrasion and impact. Most important to cost-conscious mining men who must replace worn out truck beds—J&L JALLOY LASTS FOUR TIMES AS LONG AS MILD STEEL YET IT COSTS ONLY TWICE AS MUCH.

It's easy to see why more and more progressive mining companies have found that J&L Jalloy can do a dollar-saving job in such applications as chute liners, bulldozer blades, shovel buckets, and other places where impact and abrasion limit the life of equipment.

If you're responsible for the economical operation of earth-moving or handling equipment, you'll profit by writing for a free copy of our booklet, "For Longer Wear . . . Less Repair." It gives you complete information about J&L heat-treated Jalloy plate and shows you how others are saving money with this modern mining and quarrying steel.

Workman welding 3/16" Jalloy heat-treated plate in this Moore truck body. In construction no significant welding problems have been encountered.

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Please send me a free copy of your booklet, "For Longer Wear . . . Less Repair—Jalloy, J&L Special Alloy Steel."

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SAVE UP TO 25¢ PER TON WITH

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TREATED MINE TIMBERS

The timbers in your mine represent plenty of "silver" when you consider that this one item represents 40% to 60% of your supply bill. If you let timbers ROT, you might just as well throw away a shovelful of your hard earned profits every day in the week. We can cut your maintenance cost by making mine timbers LAST LONGER. You save on timber! You save on replacement! With Osmose you can make ANY wood species, even beech, gum, hickory, ash, elm and maple, into long lasting timbers.

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We can supply you with Osmose-treated square-sawed, slabbed or round timbers, ties, collars, posts, lagging, caps, wedges or tipple timbers from one of our treating plants. These select OSMOSE-treated timbers will render many years of EXTRA service.

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We will OSMOSE-treat your own timber at our nearest treating plant. Remember, this treatment can be applied to ANY wood species, even beech, gum, hickory, ash, elm and maple.

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ommendation would have originated with this committee.

"I believe we did recommend, among other things, that more research attention should be devoted to upgrading residual fuel oil. It is obvious that the conversion from a solid, ash-containing coal to an oil would never be economical as long as it was economical in the USA to burn a practically ash-free oil under boilers where coal had formerly done the job satisfactorily. Last year 500,000,000 bbl of residual oil was consumed in this country, mostly under boilers. If this material was upgraded into gasoline, diesel and heating oils, it would add to the supply of the essential fuels by about 25%. This is a very significant figure and can extend our oil reserves by this amount.

"It should not require much of an imagination to see that it's much, much easier to make a lighter oil out of a practically ash-free heavy oil to begin with than it is to convert a solid, ash-containing coal into a light ash-free oil."

## Labor Violence Continues In Preston County Drive

Continuation of the violence that has marked the 2½-mo UMWA-led drive to organize the non-union Preston County, West Virginia, coal fields was reported early in April.

Operation of the 10-mi Northern West Virginia R.R. was temporarily interrupted April 5 following dynamiting of a switch 3 mi from Kingwood, the night before. Extending from Kingwood, the center of the recurring warfare (*Coal Age*, April, p 119), the line connects with the B.&O. at Tunnelton.

A fire April 1 that destroyed the tipple of the non-union Borgman Coal Co. some 3 mi from Kingwood was called a "plain case of arson" by the Kingwood fire chief. The blaze, which was discovered an hour after the night watchman had gone off duty, caused an estimated $25,000 damage. The mine normally employed 120 men but had recently reduced its working force because of picketing, it was reported.

The trial of nine pickets charged with stoning a bus load of non-union miners Feb. 12 was postponed April 9 until the next term of the circuit court after it was learned that the Preston County sheriff, a key witness, was ill and could not appear. The nine men were the first of the 60 previously indicted on charges of violence.

The injunction restraining UMWA officials and pickets from interfering with operation of non-union mines in the area will be submitted to the state supreme court, it was indicated March 29. Circuit Judge C. P. Wilhelm, who issued the order several days earlier, announced that he would submit it to the higher court on his own motion, an action that was reportedly agreeable to both operator and UMWA attorneys.

# We Must Pay As We Go

***We** must do our utmost to pay as we go for our present defense program.*

On that proposition those who speak with authority are remarkably well agreed. This editorial – the second in a series on our mobilization for freedom – sets forth in simple terms why there is this agreement.

Next year – the fiscal year beginning next July 1 – the federal government's budget calls for the expenditure of $10 billion more than is scheduled to be collected in taxes. The deficit is due to the increase in defense expenditures.

A part of this deficit can be eliminated by cutting non-essential expenditures and increasing efficiency in the defense program. There is wide agreement on this. It is the duty of the President and Congress to see that it is saved.

*How the remaining deficit anticipated in the federal budget–$5 billion to $10 billion–is handled is crucial.* The government can meet it by raising taxes–by paying as we go. Or it can borrow, issuing more government bonds.

## Borrow Again?

We relied heavily on borrowing in both World War I and World War II. In World War I only about one-third of the expenditures of the federal government were met by taxation. In World War II about 45 percent were met in this way. The rest we borrowed. Some people ask, why can't we rely heavily on borrowing again? Why is it crucially important to avoid adding $5 billion to $10 billion to a federal debt that is already $257 billion?

Part of the answer is found in the contrast between this defense program and our all-out effort of World War II. Another part–and one that is all-important in combatting inflation–results from the rapid decline in the purchasing power of the American dollar in recent years.

We went "all out" in World War II. We put almost half of everything we produced into our military effort. Taxes high enough to pay the financial costs as incurred would have meant huge tax increases. It was feared that such increases would kill financial incentives to get "all out" production. Since we expected the war to be short, borrowing seemed a safe expedient. Price control and rationing, with wartime patriotism to give them effective support, were relied upon to keep in check the inflationary pressure created by borrowing rather than taxing.

Our present defense program is scheduled to take a much smaller share of our production, but to take it over a much longer period. At its peak, the program as now planned will take only about 20 percent of our total national production. But, to use General Bradley's phrase, "the conditions under which we labor may persist for ten, fifteen and twenty years."

## What About Controls?

For a period of any such duration it would be foolhardy to expect that the sort of controls we had for the few years of World War II could hold in check the inflationary pressure created by not paying as we go. It would be as foolhardy as it would be for a family to plan on borrowing to pay the expenses of a member discovered to be afflicted by a chronic ailment which might last a long lifetime.

Obviously, the only safe thing to do in such a case would be to adjust the family budget so that the expenses of the illness would be paid currently.

*Our heavy reliance on borrowing in World War II had consequences which block a successful repeat performance.*

If the borrowing had been done by persuading individuals to transfer their savings into government bonds, relatively little inflationary pressure would have been created. What the government would have spent with the proceeds of such bond sales would have been subtracted from the money individual consumers could spend.

But most of the borrowing was done from banks. That course expanded the amount of money available to the government without any offsetting subtraction of money from the hands of individuals. Thus, when direct price controls were removed after the war, this bottled-up purchasing power contributed to a price inflation which has cut purchasing power of the American dollar about in half – and decidedly changed the attitudes of the American people toward that dollar.

During World War II, Americans in general believed that:

The war would not last long.

The dollar would hold its value, and even gain value after the war.

Many wonderful new products would be available in the postwar period.

Today the American people have:

Seen the value of their dollars melt away fast.

Been assured that, at best, we may have a 10-15-20-year pull ahead.

Been warned not to expect a postwar paradise anytime soon.

One result of these changed attitudes is a notable lack of enthusiasm for government bonds on the part of individual investors. This is indicated by the fact that since Korea redemptions of E bonds have exceeded sales by about $600 million. Another result is a continuing rush to convert dollars into physical goods and equipment or claims on them. This trend weighs against financing the prospective federal deficit by borrowing from individuals.

*Borrowing from banks to meet the deficit would again add fuel to inflation.*

The prospective deficit is due to federal expenditures for military goods. Even if they are not blown up or shipped abroad, these goods will not be available to civilians. But the money paid to those who produce military goods will still be available to bid up the prices of civilian goods. Thus, at a time when people show relatively little disposition to save dollars, a menacing inflationary pressure – an inflationary gap, the economists call it – will be created.

If our fight against inflation is to be successful this gap must be closed by taxes. We need to do other things, too, for inflation has many different causes. Credit expansion must be effectively controlled. Production of civilian goods must be increased as much as possible by eliminating waste and inefficiency. But a pay-as-we-go tax program is basic to a successful attack on inflation. And inflation – unless it is checked – could wreck our defense effort.

*We cannot pay as we go merely by soaking harder the corporations and those in the upper income brackets.*

As the President's Council of Economic Advisers has reported, "by far the largest part of the additional revenue must come from the middle and lower tax brackets. These are the brackets in which the great bulk of the income is located."

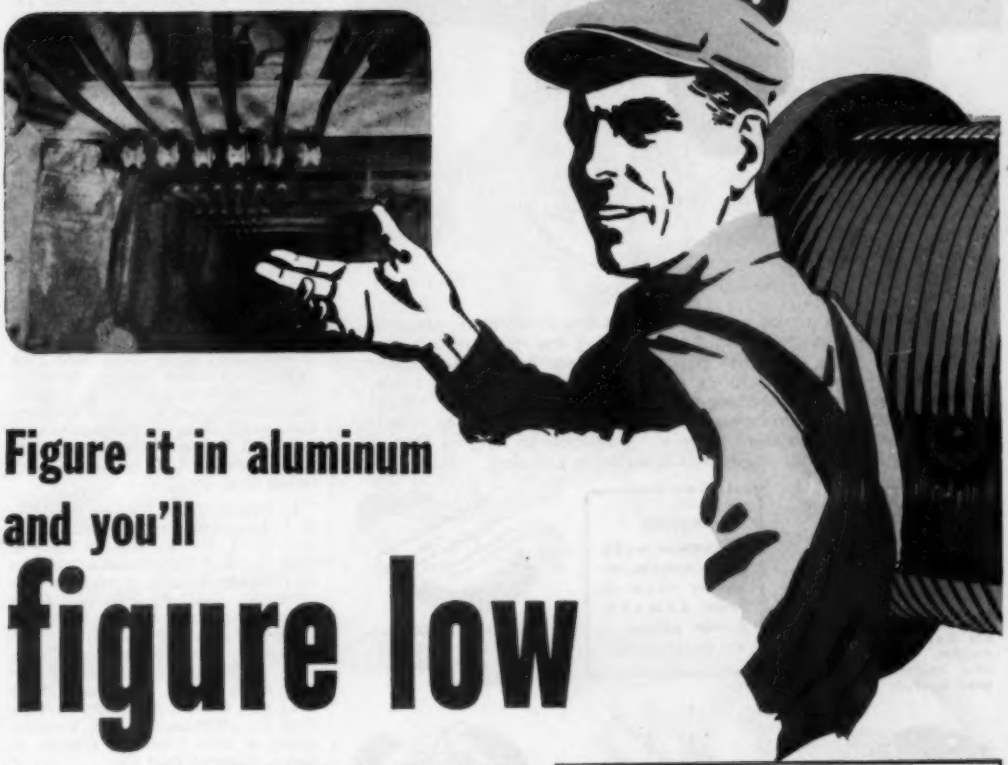
### Taxes Can Attack Inflation

By spreading tax increases broadly, taking small amounts from many people, inflationary pressure would be effectively reduced. It is the expenditures of the great mass of people, rather than the small numbers in the upper income tax brackets, that create most of the pressure. Moreover, it is possible to increase taxes broadly without killing the economic incentives to produce. Maintaining these incentives is essential to the success of the defense effort.

Our elected representatives cannot be expected to be enthusiastic about a pay-as-we-go tax program. It involves increasing the taxes of the great body of their constituents, an operation completely lacking in political glamour. However, such a program also involves the integrity of the American dollar. And that is absolutely essential to the success of the defense program. We shall be very foolish if we do not let our leaders know that we want them to do everything possible to pay as we go.

**McGraw-Hill Publishing Company, Inc.**

# Planning on new wiring?



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Although the rearmament program prevents unrestricted sale of aluminum and copper, we are ready to help you with the planning required for mine projects involving electrical wiring.

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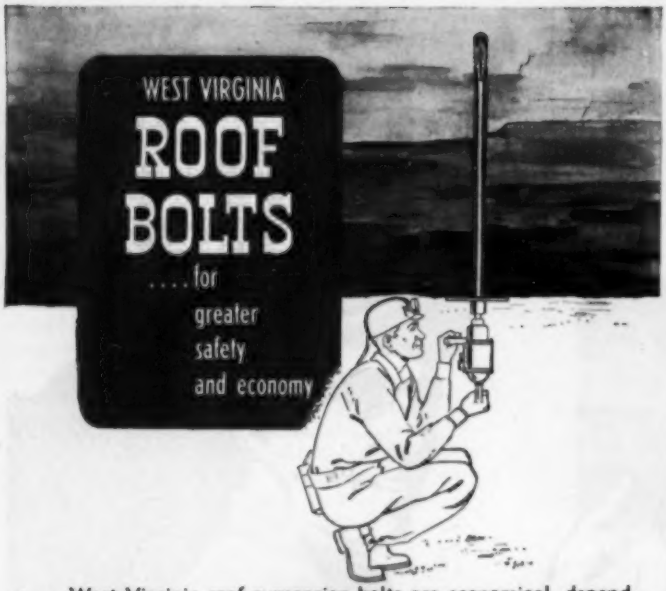


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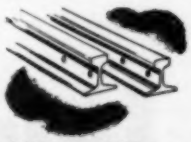

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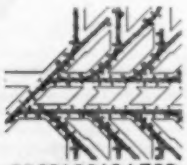

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**TURNOUTS** — Economical in use, economical in cost, easy to install and maintain.

## BCR Committee
. . . From p 139

ated industries is being made to secure an accurate appraisal of coal's research needs. The survey is expected to accurately indicate those projects industry executives feel are the most important and have the greatest urgency.

All coal companies producing over 100,000 tons annually and all coal-originating railroads with more than $1,500,000 of coal-freight revenue annually are receiving questionnaires, whether or not they financially support BCR. In addition, outstanding individuals in industries using large tonnages of coal are being surveyed for their opinions.

Nominated to the BCR Plan-of-Action Committee, in addition to Dr. Potter, who will serve as chairman, were:

Joseph H. Bowen, Pocahontas Fuel Co., Inc.; D. W. Buchanan Jr., Old Ben Coal Corp.; L. C. Campbell, Coal Div., EG&FA; Fred Carpi, Pennsylvania R.R.; Heath S. Clark, Rochester & Pittsburgh Coal Co.; A. B. Crichton Jr., Johnstown Coal & Coke Co.; George Dunglinson Jr., Norfolk & Western Ry.; E. H. Davis, New York Coal Co.; Charles Dunlap, Berwind-White Coal Mining Co.; J. D. Francis, Island Creek Coal Co.; B. R. Gebhart, Chicago, Wilmington & Franklin Coal Co.; T. G. Gerow, West Virginia Coal & Coke Corp.; R. L. Ireland Jr., Jefferson Coal Co.

L. Russell Kelce, Sinclair Coal Co.; K. L. Konnerth, Coal Div., U. S. Steel Co.; R. H. Knode, Stonega Coke & Coal Co.; H. B. Lee, Maumee Collieries Co.; George H. Love, Pittsburgh Consolidation Coal Co.; Hooper Love, West Kentucky Coal Co.; F. S. McConnell, Enoco Collieries, Inc.; H. F. McDonald, Bell & Zoller Coal Mining Co.; T. W. Martin, Alabama Power Co.; A. B. Miller, The Elmer Miller Coal Co.; George A. Miller, Peabody Coal Co.; William Osborne, Youghiogheny & Ohio Coal Co.; Charles A. Owen, Imperial Coal Co.

M. L. Patton, Truax-Traer Coal Co.; E. C. Perkins, Webb Fuel Co.; A. F. Peterson, Bethlehem Collieries Corp.; T. E. Purcell, Duquesne Light Co.; H. J. Rose, BCR; R. E. Salvati, Island Creek Coal Co.; R. D. Stockdale, Red Jacket Coal Sales Co.; W. J. Thompson, Colorado & Utah Coal Co.; Lewis C. Tierney, Premier Pocahontas Co.; J. E. Tobey, Appalachian Coals, Inc.; Walter J. Tuohy, Chesapeake & Ohio Ry. Co.; Fred G. West, Butler Consolidated Coal Co.; and Henry C. Woods, Sahara Coal Co.

## Ohio Belt Conveyor Bill Blocked in Legislature

Legislation necessary for the construction of the proposed 130-mi Ohio overland belt conveyor was reportedly killed for the current session of the state legislature March 27, when the

# "Tycol Acylkup gets cars off fast... keeps them running under all weather extremes"

That's so right! Tycol Acylkup Mine Car Grease reduces low temperature drag . . . retards lubricant leakage at high temperatures . . . permits the handling of more cars per haul. It keeps cars running in top condition inside the mine and out.

Also, Tycol Acylkup's expertly blended calcium soap and specially selected cylinder oil stock combination assure long bearing life . . . less down-time loss . . . lower maintenance costs.

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SEND FOR A FREE COPY OF "TIDE WATER ASSOCIATED LUBRICANIA"

As appearing in Coal Age; Mechanization—May 1951

Senate rules committee in a surprise move voted to suspend indefinitely any Senate consideration of the bill.

It was the second year that originators of the long-distance conveyor designed for haulage of coal and ore had suffered defeat in the legislature. Sponsors of the plan are seeking public-utility status and the right to acquire a right-of-way. The proposal was strongly opposed by the railroads, railroad-worker unions, certain local communities and other groups.

## Association Activities

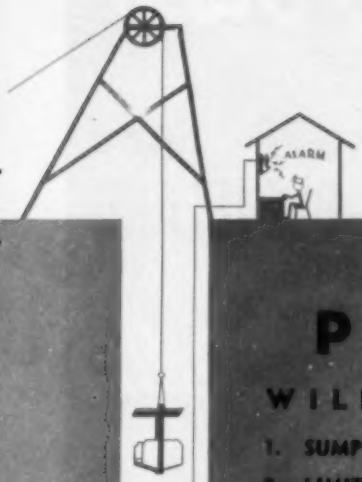
**Jesse V. Sullivan**, executive secretary of the West Virginia Coal Association since 1929, retired April 1 because of ill health. He will continue to serve the association in an advisory and consulting capacity. Mr. Sullivan, who has been active in the coal industry since 1907, joined the West Virginia group in 1925 as assistant secretary. Robert C. Norcross, his assistant for the past 13 yr, will take over his duties pending selection of a successor by a five-man committee of association members.

**Bituminous Coal Operators' Association** held its annual meeting in Washington, D. C., April 3. Officers and directors were re-elected, including: Harry M. Moses, president; Daniel W. Cannon, general counsel and secretary; and Joseph C. Chromis, treasurer. Newly named directors included: E. T. Weir, Weirton Coal Co. of the National Steel Corp.; S. Austin Caperton, Scotia Coal & Coke Co.; H. E. Jones, Amherst Coal Co.; and Henry McGinness, Northern Panhandle of West Virginia Coal Association.

**Dennis J. Keenan**, general superintendent, Sterling Coal Co., Bakerton, Pa., has been elected president of the Central Pennsylvania Safety Association for the third consecutive term. Walter C. Fancourt, chief engineer of the mine sealing division of the Pennsylvania Department of Mines, has been elected vice president, and Joseph C. Leonard, president of the Adams Fuel Corp., has been elected treasurer.

**Pocahontas Operators' Association** re-elected all its officers at its annual meeting in New York City, as follows: president, William Beury, president, Algoma Coal & Coke Co.; vice president, H. R. Hawthorne, president, Pocahontas Fuel Co., Inc.; treasurer, Henry F. Warden, president, American Coal Co. of Allegany County; and secretary, B. B. Houseman. Elected members of the executive committee, in addition to Messrs. Beury, Hawthorne and Warden, were Roland C. Luther, J. J. Foster and James A. McQuail. All members of the association representing it on boards of affiliated organizations were re-elected.

# "Hazleton"

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### WILL CHECK YOUR PUMPS FOR:

1. SUMP LEVEL—START, STOP, HIGH WATER ALARM
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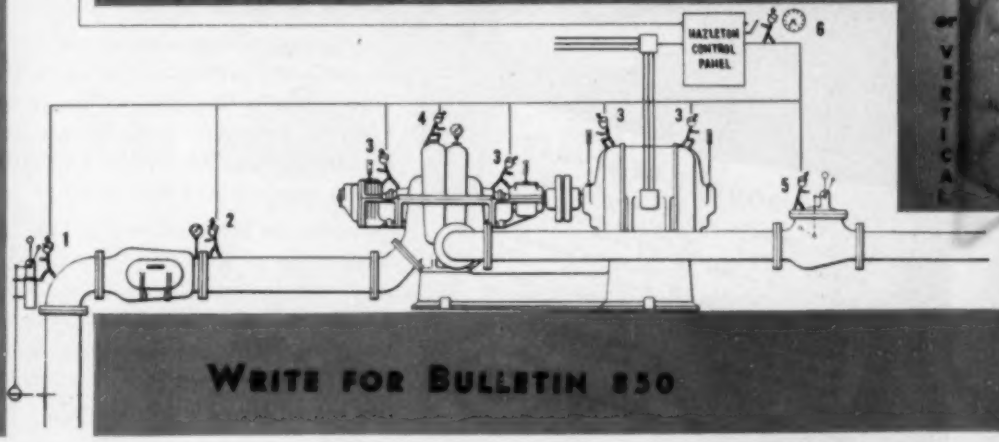
3. BLOCKED STRAINER—EXCESSIVE SUCTION LIFT.
4. COLUMN LINE FAILURE—LOSS OF PUMPING HEAD
5. OVERHEATED BEARINGS—THERMOSTATS ON PUMP AND MOTOR
6. LOSS OF WATER—BROKEN SHAFT, AIR LEAK, ETC.

CONTROL FOR ANY INSTALLATION—HORIZONTAL—OR VERTICAL




WRITE FOR BULLETIN 850

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# Save time on Pesky Jobs

## with the 18-pound Le Roi-CLEVELAND Hornet Rock Drill

### H-22 HORNET FEATURES

- Weight — 18 lbs.
- Powerful blowing
- Strong rotation — easy holding
- Both wet and dry types
- Conventional rifle-bar rotation (3 pawls)
- Replaceable spacer bushing
- Spade or Tee handle
- 2-piece chuck and rotating sleeve
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- Chuck size 7/8" hex x 3 1/4" — adapters too
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### ...and your miners can put more work on production

The H-22 Hornet is a terrific little rock drill. It weighs only 18 lbr., but it has all the design features found in larger Le Roi-CLEVELAND machines. That is why, pound for pound, you can't beat it for drilling speed.

And here's what your miners can do with it—easily and quickly, without strain: Drill holes for trolley hanger bolts. Clean up roof. Clear out rock falls. Brush bottom. Drill oversize pieces at the grizzly. Cut hitches. And a thousand and one other odd jobs.

Because the H-22 Hornet is so light, and drills so fast for its weight, your miners get these tasks done in a hurry — more time can be spent on production; your costs look better. So equip your miners with Le-Roi CLEVELAND Hornets. Complete information is available — just write for it.

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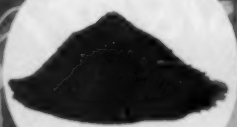
# CUT COAL CLEANING COSTS

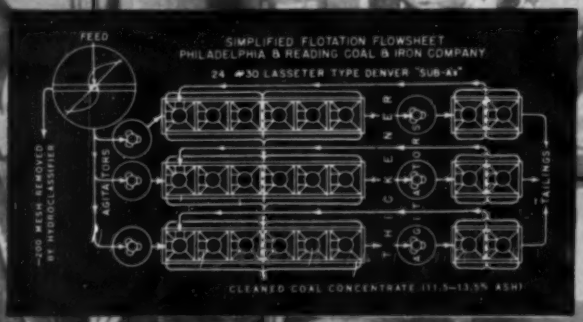
## *with Denver "Sub-A" (Lasseter Type) Flotation*

**Philadelphia and Reading Coal and Iron Company — Now operating at the rate of one ton of marketable coal fines per minute.**

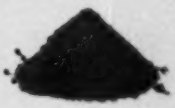
**FEED**



**Ash: 24-30%**




**REJECT**



**Ash: 59-65%**

**CLEAN COAL**

**Ash: 11.5-13.5%**

**Products:** Anthracite Coal Fines
**Particle Size:** Minus 10 mesh to plus 200 mesh
**Tonnage:** 120 TPH initial feed
**Flotation Cells:** 24 No. 30 (Lasseter type) Denver "Sub-A" Cells
**Flotation Concentrate:** Sixty tons per hour (One ton per minute)
**Ash Content:** 11.5-13.5%
**Reagent Cost:** Less than 15 cents per ton feed

Write for Bulletin M4-B37

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BE SURE TO SEE
DENVER COAL FLOTATION IN ACTION
at the Cleveland Coal Convention & Exposition, May 14-17.

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In one of the seven "torture" tests given to this cable, a sample of Royal jacket (0.100 inch thickness) is first weighed, then immersed in distilled water at 70 degrees C for seven days. It is then removed and weighed and the amount of water absorbed is calculated. U. S. Royal Mining Machine Cable's jacket absorption is never more than 60 milligrams per sq. in.

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Be sure to visit
BOOTHS 2565, 2569 and 2669
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(FLOAT AND SINK)
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Our staff of experienced coal preparation engineers will be glad to discuss your coal preparation problems and explain the many advantages of the NELDCO Heavy Media Precision Coal Cleaning System which can be adapted to small as well as large production mines.

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HUNTINGTON • WEST VIRGINIA

# Defense Developments

## Mining Machinery Makers Get Steel Allocation

The National Production Authority has allocated 20,000 tons of steel for the month of June to manufacturers for production of new mining machinery and equipment. The allocation does not include steel for repair parts, which may be secured by mines through DO-97 ratings under NPA Regulation 4 and extendible by manufacturers.

The division of the steel among mining manufacturers will be made by a combined committee of the Defense Minerals Administration and the DSFA, based on figures already on hand. Third- and fourth-quarter requirements of mining-machinery manufacturers for steel, copper and aluminum were to be collected shortly by the defense agencies, it was reported at the end of March.

## Government Sets July 1 For Control of Metals

The government announced April 12 that it would put into effect July 1 a Controlled Materials Plan for steel, copper and aluminum. Under the plan, available supplies of critical metals can be matched against military and civilian requirements and allocated accordingly, the National Production Authority reported.

Although based on a similar plan used in the last war, the control will be limited for the time being to direct allocations made only for production involving defense and defense-supporting production and construction. While definite figures were not available, it was expected that some 40 to 50% of the annual supply of steel, copper and aluminum would be allocated under the CMP.

Allocations will be made quarterly and will be based on reports of anticipated requirements filed by manufacturers with the NPA. While the defense effort at present does not justify an "all-out" Controlled Materials Plan, "we want to be prepared to put such a plan into full-scale operation at an instant's notice," said Manly Fleischman, NPA administrator. The new plan "makes it possible to authorize specific production schedules and make firm allotments of the three basic metals needed to meet, but not exceed, direct defense and defense-supporting and construction goals—on time and in the proper quantities," he emphasized.

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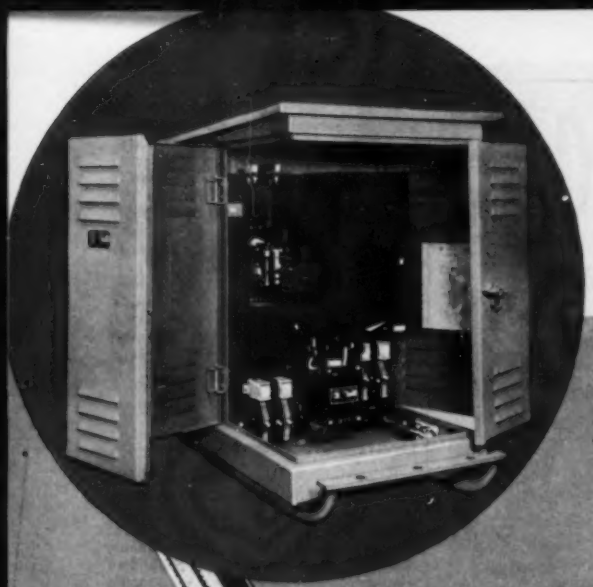
## DSFA Offers Industry Help In Obtaining Scarce Metals

It is a part of the job of the Defense Solid Fuels Administration "to assist the industry in getting necessary supplies at lawful prices" and producers who are unable to do so after "reasonable effort" should give his office the "full facts," Charles W. Connor, head of the agency, said March 29. Mr. Connor, who spoke at a meeting on the economics of bituminous coal sponsored by the West Virginia University Department of Economics and Business Administration, also urged the summer stockpiling of coal by industrial consumers and homeowners as "an important phase of our defense effort."

Stating that "we are confident that the solid-fuels industries will obtain their full share" of the scarce materials necessary as shown by DSFA surveys, Mr. Connor said: "We have completed our over-all requirements program covering the needs of the solid-fuels industries for steel, copper, aluminum and other scarce materials and are now awaiting action by NPA in making available the necessary allocations of these materials. A similar program has been presented on behalf of mining-machinery manufacturers . . . and an initial allocation of steel for them for the month of June, 1951, is now being made. A pro-



# *Produce more coal*

## WITH I-T-E SECTIONALIZING SWITCHGEAR

### Type KSC Mine Sectionalizing Circuit Breakers Protect Circuits Minimize Outages

***MORE COAL IS PRODUCED BECAUSE...***

**1.** Trolley and feeder disturbances are localized to areas of origin... no affected mine areas continue to operate.

**2.** All feeders and trolleys are tied into a single network ... improving voltage throughout the entire system. This prevents distant stations from feeding into a fault and spreading trouble.

***I-T-E CIRCUIT BREAKERS...***

**1.** Open automatically on overload, short circuit or voltage failure.

**2.** Remain open a definite and adjustable time interval, regardless of cause of opening.

**3.** Reclose only on pre-selected and pre-determined line conditions.

**4.** Can distinguish in reclosing between short circuits and low-value load resistances.

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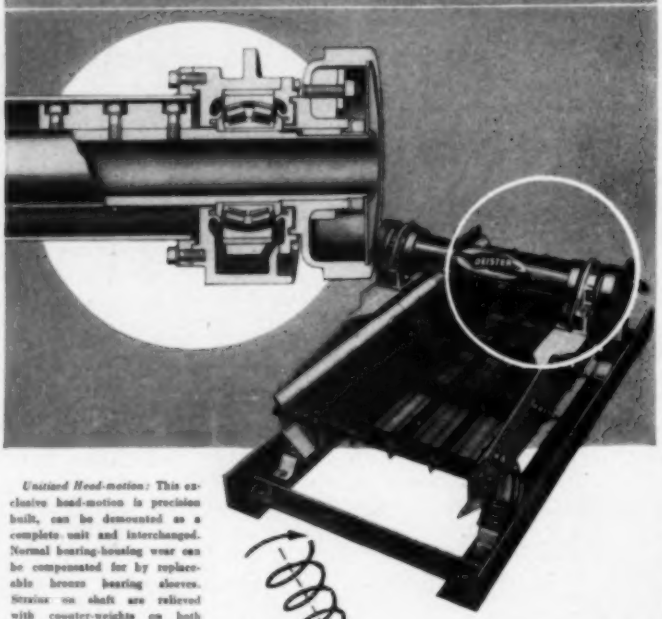
SWITCHGEAR • UNIT SUBSTATIONS • ISOLATED PHASE BUS STRUCTURES • CIRCUIT BREAKERS
MECHANICAL RECTIFIERS • RESISTORS • SPECIAL PRODUCTS

# Screens Any Carbon Coal without blinding



*Unitized Head-motion:* This exclusive head-motion is precision built, can be demounted as a complete unit and interchanged. Normal bearing-housing wear can be compensated for by replaceable bronze bearing sleeves. Strains on shaft are relieved with counter-weights on both sides of spherical roller bearings.

**Properly install this Deister Carbon Coal Screen and you can be sure of *high* capacity in handling *any* carbon coal, *no matter how damp or sticky it may be.***

**Not once since it was introduced two years ago, has this screen failed to perform *satisfactorily without blinding.***

**And here are the three *proved* reasons why:**

1. ***Longer stroke:*** **The special construction features permit a longer stroke at higher speed than found on any other screen.**
2. ***Far higher speed:*** **This screen operates at up to 2,000 rpm . . . that's 2,000 complete cycles per minute.**
3. ***Graduated length of stroke:*** **The exclusive head-motion also amplifies the stroke more at the feed end where material is deeper, with a lesser stroke at the discharge end where accuracy is your goal.**

**All of these things are possible because of the new, unitized head-motion and the super-strong but light weight aerodynamic type of construction.**

***Plus:*** **In addition to these features, you also obtain the well-proved Deister screen-cloth tension features which eliminate whipping . . . the special springs which isolate all vibration from supporting structure . . . adjustable throw, simply made in a few minutes . . . and interchangeable flywheels so you can place the *drive on either side.***

**For high capacity without blinding on any Carbon Coal, specify a Deister Carbon Coal Screen. Write for Bulletin No. 52 today.**

**See the new Unitized Life-time Head-motion at Booth 2455 at the Coal Show.**

DEISTER SCREENS

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gram for the benefit of coke-oven operators is being processed."

Pointing out that voluntary methods "are becoming less and less effective and must be supplanted eventually by controls," Mr. Connor reported that "if a Controlled Materials Plan is found necessary, it will probably not become effective before July 1, 1951. In the meantime we will endeavor to see that the solid-fuels industries do not lack for needed materials." A program of "serialization" of mines, which would be helpful in assisting them to secure needed supplies and equipment, probably will be approved in the near future, Mr. Connor said.

## Procedure Important in Draft-Deferment Cases

Some mining companies have had requests for Selective Service deferment of employees denied by local boards, and appeals rejected by appeal boards, because, among other reasons, the time limit for filing appeals had elapsed, the National Coal Association recently reported to members.

It is important that the selectee inform his employer when he receives his classification questionnaire from the local board since a request for deferment must be filed before or with the return of the questionnaire, the NCA points out. If the deferment is denied, the employer may appeal to the state appeal board, but only "within 10 days after the date the local board mails to the registrant a notice of classification (SSS Form No. 110)."

An official statement from the Director of Selective Service outlining the proper procedure was quoted by the NCA as follows:

"Selective Service Regulations provide local boards with ample authority to defer an employee whose employment is found to be necessary to the maintenance of the national health, safety, or interest.

"The Selective Service Act of 1948, as amended, prohibits deferments by groups or categories and requires that each deferment granted must be given on the basis of the individual status of each registrant. Responsibility for the classification of registrants lies initially with the local board. Rules and regulations as prescribed by the President, and under which local boards operate, are broad. They are not complicated nor do they confuse the issue by attempting to spell out the case of any person or group of persons.

"Any employer of civilian manpower may present to the local board in detail all he may wish to offer in support of any request for deferment of any individual liable under the Act. The employer may present his request in writing in any manner he deems appropriate inasmuch as no special form is provided or required in this instance. If a request for occupational deferment is denied by the local board, the registrant or his employer, if he filed a request for deferment prior to the classification from which he de-

That iron wire cap he's using is O.K.

**THERE'S THIS** about Du Pont Iron Wire Electric Blasting Caps—they'll do the job . . . get the coal out . . . and they're economical.

**TRUE** . . . copper wire caps are preferable in a few cases. But right now, copper is very short by reason of Uncle Sam's defense activity, and these iron wire caps will almost always serve the purpose equally well.

**THEY'RE TOP QUALITY**... the iron wire caps coal-mine type, have all the desirable features of other Du Pont Electric Blasting Caps, including nylon insulation, rubber plug closures and shielded shunts. In addition, the insulation is white—for the greatest possible contrast to the coal—and the wires can readily be removed by magnetic separators. And, while iron wire caps have higher resistance than copper, the permissible multiple-shot blasting machines have ample capacity for most of that kind of shooting.

**WHAT'S MORE**...there's a plentiful supply of these dependable detonators. Your Du Pont Explosives representative will gladly consult with you as to the possibility of using them in your mine. Talk with him soon . . . he can help you in many ways. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

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# DU PONT EXPLOSIVES

***BLASTING SUPPLIES AND ACCESSORIES***

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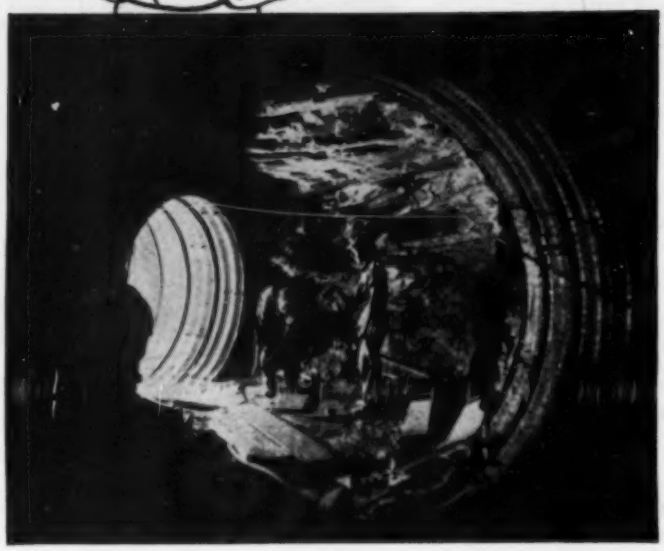
***BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY***

# These Liner Plates are "All Muscle"



There is no "fat" on an Armco Liner Plate.

All excess weight and bulk has been eliminated. Corrugated metal design provides safe strength with less weight and material. It saves metal and money.

Installation is simplified too. One man can carry, hold and bolt an Armco Liner Section into place. Only a hand wrench is needed. Less bulk also means less excavation, and storage requirements are smaller.

Other advantages of Armco Liner Plates include fire-resistance, freedom from excessive maintenance and a wide range of sizes to meet every need. Plan now on using Armco Liner Plates for that next entry, air shaft, substation or similar job. Consider them too, for relining and strengthening existing passageways. Write for complete information. Armco Drainage & Metal Products, Inc., 2771 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation.

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ARMCO LINER PLATES


## COAL MEN ON THE JOB

RED JACKET COAL CORP., Coalburg mine, Red Jacket, W. Va.—Jim Melmige (left), belt maintenance foreman, and Dorsel Steele, assistant general mine foreman.

KELLEY'S CREEK COLLIERY CO., Maiden mine, Maidsville, W. Va.—Lee Baker (left) and T. E. Jones, tipple foreman.

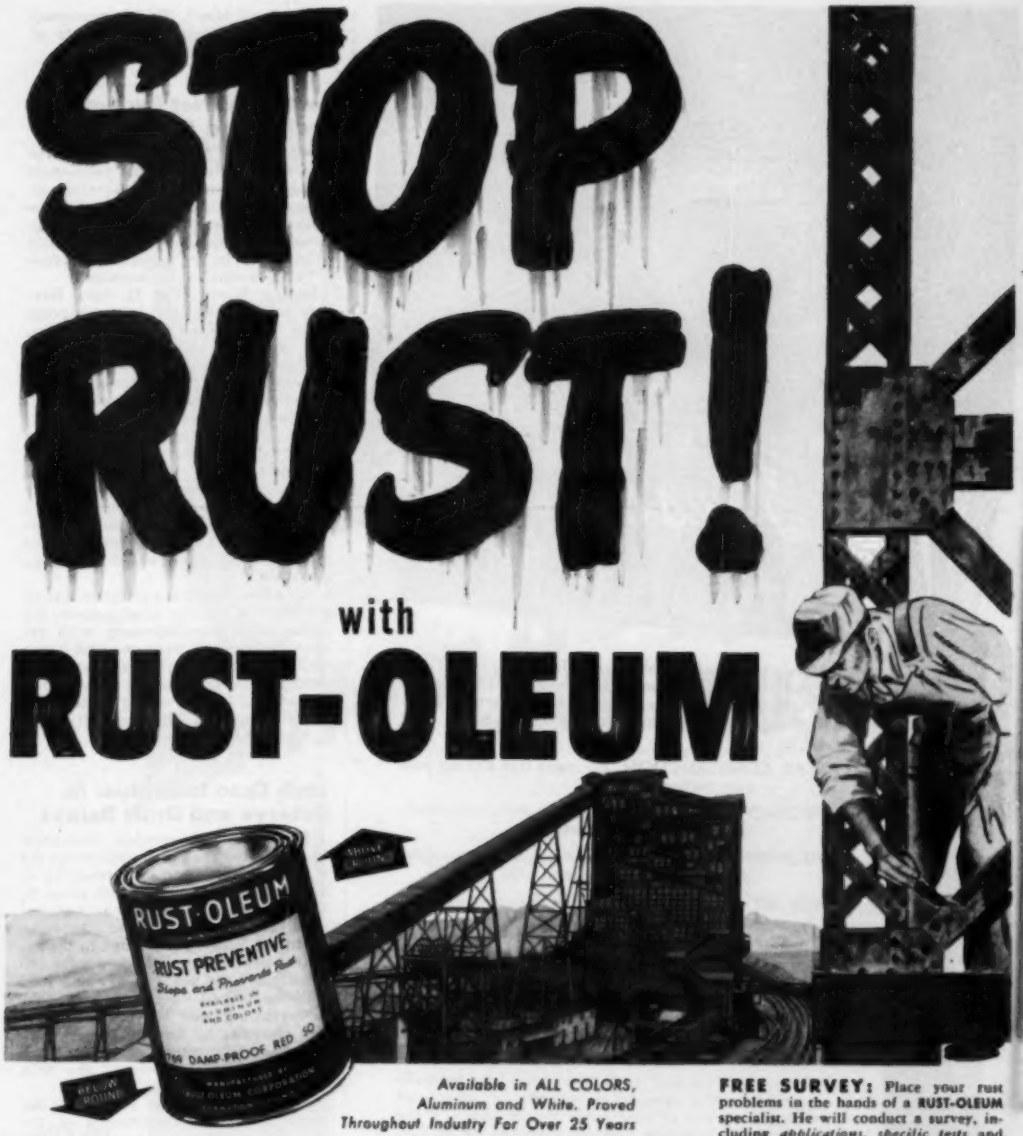
sires to appeal, has the right to appeal as set forth in the Selective Service Regulations. If the appeal board upholds the classification given by the local board, but, if in doing so, one or more members of the appeal board dissents, then the appellant has recourse to the Presidential Appeal Board which has adequate power to act in all cases coming before it.

"It is to be observed from the information outlined above, that either the registrant or his employer may request occupational deferment and in support of such request they are at liberty to set forth any information which they believe should be considered as indicating that the registrant's activity in the above-mentioned employment is necessary to the maintenance of the national health, safety, or interest.

"It is suggested that in all cases complete information should be provided to a registrant's local board and it should normally be submitted with the registrant's questionnaire or at least prior to the classification action

# STOP RUST!

## with RUST-OLEUM




*Available in ALL COLORS, Aluminum and White. Proved Throughout Industry For Over 25 Years*

Deep underground pipes, coal cars, machinery — tipples and surface equipment — all *rustable* metal surfaces need **RUST-OLEUM!** The *exclusive* formula that resists fumes, moisture, weathering, most acids and chemicals! Goes on easily by brush, dip or spray . . . dries to a firm, airtight, *decorative* finish!

May be applied over surfaces *already rusted* without removing all the rust. Specify **RUST-OLEUM** to your painting contractor or maintenance department for new construction, maintenance or remodeling. Prompt delivery from Industrial Distributor stocks in principal cities. Write for *complete* literature — *today!*

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- ☐ We Have A Rust Problem — Have A Qualified Representative Call
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**RUST-OLEUM CORPORATION**
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Here's the kind of job that calls for Collyer *Twin Parallel Type G Mining Cable*—specially constructed to take the punishment of trailing cable service. Look at the power-protecting features of this heavy duty cable:

**FLAT CONSTRUCTION** for wear-free flexing and easy reeling

**PROTECTED GROUND WIRE** for positive grounding of off-track equipment

**NEOPRENE JACKET** — proof against flame, abrasion, chemical action, and oils

**RUBBER INSULATION** of high dielectric strength for greater corona resistance and full moisture protection . . . highly resilient to cushion against sharp or crushing blows

**MEETS REQUIREMENTS** of Penn. Dep't of Mines and U. S. Bureau of Mines for flame resistance — carries approval number P107 embossed on cable sheath, assuring safe performance on every installation.

No wonder Collyer Type G is so widely used for trailing cable service in mines. It will pay you to consult with us on your mining cable requirements. Write for recommendations. Collyer Insulated Wire Co., 245 Roosevelt Ave., Pawtucket, R. I.

*NOTE:* — This cable is now furnished in black only, in compliance with NPA Order M-2, Supplement 1 — Effective February 19, 1951.

CHOOSE Collyer MINING CABLES

of the local board. This is necessary to vest in the employer his right of appeal."

## Deferment Not Permanent Draft Head Emphasizes

Deferments provided by Selective Service regulations are not permanent exemption from military service and an employer should try to secure or train a replacement, Gen. Hershey, director of Selective Service, recently pointed out in an appearance before a Congressional subcommittee.

During World War II, Gen. Hershey said: "It was one of our hardest tasks to convince many employers, and groups of employers, that a deferment was exactly what the word meant—a delay or postponement of induction, not a permanent exemption. So when a local board defers or postpones a man's induction at the request of an employer, the obligation of the employer is plain. He must utilize the period covered by the deferment or postponement—whether for 30 days or more—in finding a replacement for his key man, or by training another man—or perhaps a woman—to take his place.

"If a local board has evidence that an employer is making arrangements for replacement simultaneously with requesting a short postponement for a skilled worker and the business or industry is necessary to the maintenance of national health, safety or interest, there is little likelihood that it would be refused," he pointed out.

## Each Case Individual in Reserve and Draft Delays

Experience of member companies has indicated that each application for a delay in the recall of a reservist or deferment of a draftee must stand on its individual merits, the National Coal Association reports. Actually, there has been little change in the required procedures since they were originally set up last summer and it is still the duty of the employer to make a convincing case that deferment of the reservist or draftee is necessary "to the maintenance of the national health, safety or interest," the NCA emphasizes.

Under the policy originally announced by the Department of Defense, a reservist was entitled to consideration for delay in recall if his occupation was listed in the "List of Critical Occupations" issued by the Department of Labor and he was employed in an essential industry included in the "Tentative List of Essential Activities" released by the Department of Commerce. He also was entitled to consideration if he had a key position in an essential activity.

While each local draft board recently has received copies of these lists from the SSS national headquarters for use as guides, it is not required to follow such classifications. The local board has the full power to

# Low Cost Crushing-

THE McLANAHAN

# Bantam Buster Single Roll COAL CRUSHER

*—with cut Gears—Segment Rolls and Renewable Crushing Plate Tips*

Crush hard or soft coal in strip or underground operations with the dependable, low cost McLanahan Bantam Buster *Single Roll* Coal Crusher. This machine crushes coal to desired size, with a minimum of operating and maintenance expense.

Bantam Busters have a high ratio of reduction and are portable, self-contained units, adaptable for any installation. They are furnished with 18" diameter roll up to 48" wide, and 24" or 30" diameter roll up to 60" wide. Crushing plate is quickly and easily adjusted to vary size of product. Roll and counter-shafts are carried on babbitted or self-aligning roller bearings. Investigate the possibilities of this machine for your operation.

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*Said a hen to herself, "I'm afraid it*
*Is hard to size each egg to grade it.*
*If Bee-Zee made a screen*
*I could sit there serene*
*And grade every egg as I laid it!"*

# *Make more Money with* ACCURATE SIZING

Increase your profit by selling more of the coal you mine — by stopping "fines" from fattening the slurry pile. The *exclusive* round rod design of Bixby-Zimmer Screens keeps screen openings accurate, even with 50% wear! Stainless steel welded construction means that Bee-Zee Screens are rugged and sturdy — provide uniform sizing for all of their long lives.

**CONSTANT SCREEN OPENING**

Even when the screen wears half-way through, the opening stays the same. You can use Bee-Zee Screens longer — in fact, coal operators report 10, 20, even 30 times more life in Bee-Zee Round Rod Screens.

**NON-BLINDING ACTION . . .**

Fine point of contact between top and tie rods eliminates any "pockets" where small pieces of coal could clog. This means faster, better dewatering, too — reducing the danger of freeze-ups in cold weather.

**SEE YOU AT THE CONVENTION**

Don't miss us at the Mining Congress Convention, May 14-17. We'll be at Booth 607 in Cleveland's Public Auditorium. Stop by and get the latest facts on Bee-Zee Round Rod Screens.

*Write for the free screen information catalog explaining all the features of Bee-Zee Screens and their use in coal processing. No cost or obligation.*

BEE ZEE **BIXBY-ZIMMER ENGINEERING CO.**

150 ABINGDON STREET, GALESBURG, ILLINOIS

BEE-ZEE ROUND ROD SCREENS can be fitted to any coal processing equipment.


## COAL MEN ON THE JOB

THE NEW RIVER CO., Stanaford No. 2 mine, Mt. Hope, W. Va.—James P. Bibb (left), payroll clerk, and J. W. Weir, superintendent.

THE NEW RIVER CO., Stanaford No. 2 mine, Mt. Hope, W. Va.—M. E. Pennington (left), chief electrician, and O. R. Morrison, electrician.

decide whether an individual is necessary to an essential activity and in fact, whether a company is engaged in an activity in its area that is essential to the "national health, safety or interest." Coal mining is included in the "List of Essential Activities," but it is, nevertheless, imperative that every coal company present the full facts of the industry's importance and the company's place in it wherever local boards do not recognize such facts.

A revised "List of Essential Activities" was issued by the U. S. Department of Commerce April 7, and it was currently reported that the Labor Department would revise its "Critical Occupations" list within the near future. With its new list, the Commerce Department pared the 72 broad types of "Essential Activities" to 25. Coal mining is included in Classification 9, headed "Metal and Nonmetallic Mining and Smelting."

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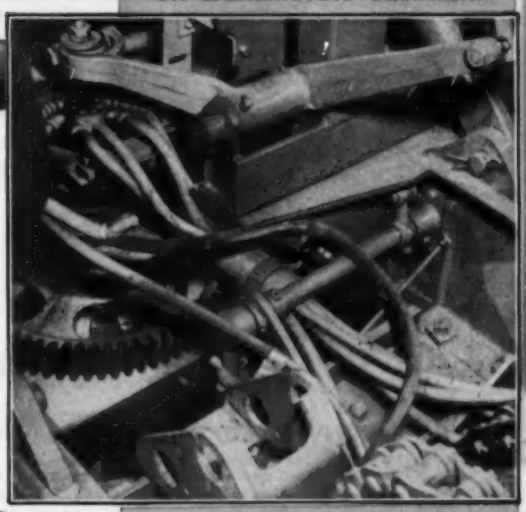
ON EARTHMOVING EQUIPMENT



Save time, save money and reduce inventory by putting the "Aeroquip Idea" to work for you. With Aeroquip you make your own flexible hose assemblies by cutting bulk hose to desired lengths and attaching Aeroquip Reusable Fittings. Assembly can be accomplished quickly and easily right on the job. No special tools are required. No training is needed. Aeroquip high quality Flexible Hose Lines improve performance and reduce maintenance. They eliminate leaks due to vibration and operate dependably at extremely high or low temperatures. They are widely used for hydraulic fluid, water, air, lubricating oils, gas and Diesel fuels and many other fluids.

Always first

B.D. chalk onto the money saving idea—Joe

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With ten years of cutting machine conversion experience as a background, the Lee-Norse Company, after exhaustive analysis, has pioneered another development in the modern trend toward trackless mining—TRACK-MOUNTED LOADING MACHINES CONVERTED TO RUBBER TIRE MOUNTINGS !

Save on your present investment and lower your production costs . . . take advantage of the desirable, mobile features of rubber-tired mining equipment . . . CONVERT YOUR LOADING MACHINES NOW !

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The Lee-Norse Company specializes in converting track-mounted cutting machines and loaders to rubber tires . . . conversions that can result in modernization and years of additional service to your present track-mounted equipment. Rubber-tired mining equipment permits faster tramming at the working face and minimizes the wear-and-tear on your mine road beds. Profit by the advantages of trackless mining now ! IT'S SMART . . . TO CONVERT !

Our engineers will be pleased to furnish estimates and delivery dates on converting your track-mounted cutting machines and loaders. Write or telephone . . .

**Lee-Norse Company**
CHARLEROI, PA


## Preparation Facilities

**Red Jacket Coal Corp., Mitchell Branch, W. Va.**—Contract closed with Roberts & Schaefer Co. for complete coal-preparation plant embodying a Link-Belt air-pulsated wash box for cleaning 5x⅜ coal at the rate of 300 tph; ROM input, 350 tph; ⅜x0 coal to be uncleaned.

**Peerless Coal & Coke Co., Vivian, W. Va.**—Contract closed with Roberts & Schaefer Co. for complete coal-preparation plant embodying R&S Super-Airflow coal-cleaning units; capacity, 100 tph, ¼x0 coal.

**Stoker Coal Co., Scuddy, Ky.**—Contract closed (by J. R. Hoe & Sons, Inc., Middlesborough, Ky.) with Jeffrey Mfg. Co. for one No. 200 unit washery; capacity, 150 tph, 5x¼ coal.

**Peabody Coal Co., Pawnee, Ill.**—Contract closed (by Roberts & Schaefer Co.) with Jeffrey Mfg. Co. for one 3-compartment 8-cell Baum jig; capacity, 520 tph, 6x0 coal.

**Ponfeigh Smokeless Coal Co., Garrett, Pa.**—Contract closed with Jeffrey Mfg. Co. for one No. 100 unit washery; capacity, 60 tph, 5x¼ coal.

**Valley Camp Coal Co., Elm Grove, W. Va.**—Contract closed (by Allen & Garcia Co.) with Jeffrey Mfg. Co. for one 2-compartment diaphragm jig; capacity, 139 tph; 6x0.

**Ontario Mining Co., Cokeburg, Pa.**—Contract closed with K. Prins & Associates for cleaning plant to handle 200 tph of 7x¼ coal; equipment to include 200-tph Prins unit washer, Robins vibrating screen for removing minus-¼ from raw coal, Hazleton pumps, Louis Allis motors, Falk speed reducers and Prins Streamcleaner to maintain a closed washery system.

**Delmont Fuel Co., Greensburg, Pa.**—Contract closed with K. Prins & Associates for plant addition to wash 100 tph of ¼-inx20-mesh in present Jeffrey Baum-type washer; equipment to include American Air Filter Cascade-type dedusters for removing the minus 20-mesh, American Air Filter Roto-clone dust collector, four McNally-Carpenter driers, and two 16-in-diameter Prins Streamcleaners for recovering fines from circulating water and maintaining closed water system; with extensive alterations to be made to present coal handling facilities to incorporate this equipment.

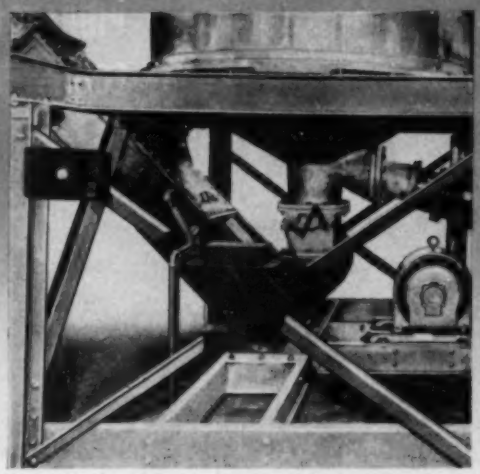
**Sunday Creek Coal Co., Adams Mills, Ohio**—Contract closed with K. Prins & Associates for construction of coal-loading plant to handle 150 tph of ROM coal to be prepared over Robins vibrating screens, Jeffrey Flex-tooth crusher and Barber-Greene belt conveyors for loading either to railroad cars or trucks.

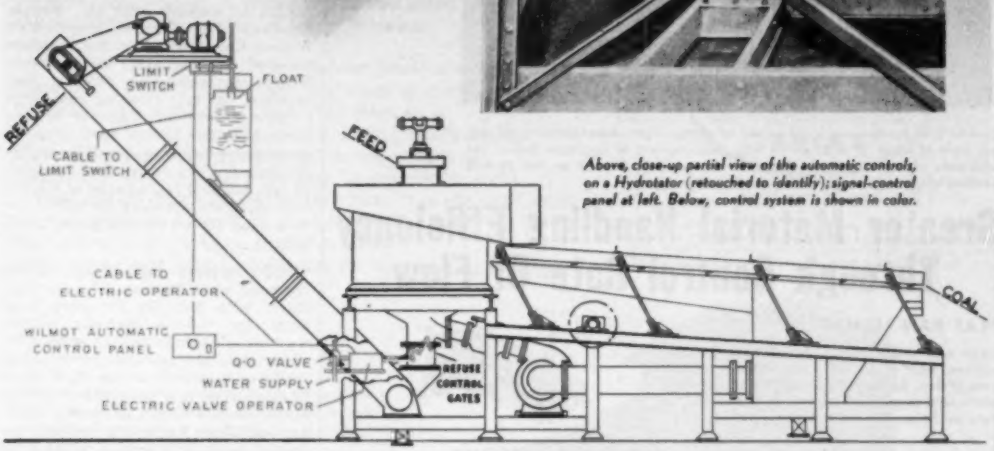
**Rydesky Mines, Emporium, Pa.**—Contract closed with K. Prins & Asso-

# PATENTED AUTOMATIC CONTROLS

Now *Standard* on

**Wilmot Hydrotators**
**Hydrotator-Classifiers**
**Froth-Flotation Units**






*Above, close-up partial view of the automatic controls, on a Hydrotator (retouched to identify); signal-control panel at left. Below, control system is shown in color.*

## Consistent Accuracy of Wilmot's New Refuse and Clean Coal Controls Has Been Confirmed by 2 Years of Field Tests

Two years ago Wilmot introduced patented automatic controls that promised a far step toward "push button" preparation. Since then they have been installed at scores of operations, representing wide variations in feed conditions. Field tests developed an impressive record of consistent increases in ash content of refuse, and accuracy of quality control. Consequently the controls are now standard on all models of Wilmot Hydrotators, Hydrotator-Classifiers, and Froth-Flotation units. The Wilmot line includes preparation units for all sizes of plants and coal sizes. Equipped with new controls, they offer advanced methods of increasing coal recovery, with no increase of costs.

*120-Page Book on Coal Cleaning*
*SENT ON REQUEST*

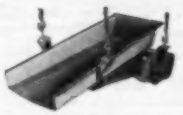
**WILMOT ENGINEERING CO.**
HAZLETON, PA.
*Plant:*
WHITE HAVEN, PA.

Syntron F-45 Feeder units, mounted on 15 degree down slope, handling 40 tons per hour of minus ¼ x 28 mesh, 30% moisture, coal to Carpenter Driers. The efficiency of the driers was materially increased by the use of the Syntron Feeders which maintain a constant, uniform flow.

# Greater Material Handling Efficiency Through Control Rate Of Flow

### FLAT PAN FEEDERS

Feed coal and/or refuse to crushers, grinders, screens, wash boxes, etc., at variable controlled rate of flow. Available in various sizes and trough styles with capacities from pounds to hundreds of tons per hour.



### VIBRATING GRIZZLIES

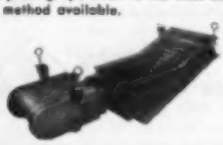
Vibrating Grizzly Feeders offer variable controlled feeding and coarse sizing. They are used in heavy tonnage scalping operations ahead of crushers, picking tables and to pad belt conveyors with fines.

### PICKING TABLES

Provide a controllable feed rate with a very short vibration stroke that assures higher picking efficiency with less fatigue to the pickers. Raise the efficiency of any process, for any industry, where a hand picking operation is the most economical or sole method available.

### VIBRATING SCREENS

Screening material wet or dry, with single or multiple decks, to bypass fines and size the product for separate bins and hoppers. Dual purpose in design it provides a screening operation simultaneously with feeding.



*Write For Catalog Data*

**SYNTRON COMPANY**
875 Lexington Homer City, Pa.


ciates for Prins coal-washing equipment for cleaning 100 tph of 4x¼ coal; equipment to include Prins unit washer, Robins vibrating screen, Allis-Chalmers pumps and Prins Streamcleaner for recovering solids and maintaining a closed washery system.

**Clinchfield Coal Co., Moss mine, Moss, Va.**—Shipment by Deister Concentrator Co. of 24 SuperDuty Diagonal-Deck No. 7 coal-washing tables for cleaning ¼x0 coal.

**Youghiogheny & Ohio Coal Co., Van mine, Marnie, W. Va.**—Shipment by Deister Concentrator Co. of seven SuperDuty Diagonal-Deck coal-washing tables and one 14-way Concenco revolving feed distributor (in addition to seven tables reported previously shipped, for a total of 14 to be used in plant).

**Pursel Coal Co., Shamokin, Pa.**—Contract closed with Wilmot Engineering Co. for one Type A jig for stove and nut coal; feed capacity, 15 tph.

**John G. Connell Coal Co., Beaver Meadows, Pa.**—Contract closed with Wilmot Engineering Co. for complete fine-coal cleaning plant incorporating Wilmot froth-flotation process, feed capacity, 135 tph; cleaning equipment to include: one 5-ft-diameter Wilmot Hydrotator for barley, feed capacity, 40 tph; one-6-ft-diameter Wilmot Hydrotator for No. 4 coal, feed capacity, 50 tph; and one 12-ft-diameter Wilmot froth-flotation classifier for minus ⅜-in to plus 100-mesh, feed capacity, 45 tph.

**Mid-Continent Coal Corp., Green Diamond mine, Marissa, Ill.**—Contract closed with McNally Pittsburg Mfg. Corp. for 450-tph McNally Norton washing addition to replace present facilities, and new raw-coal prescreening facilities to permit entire ROM input to be crushed to 4 in prior to washing in one No. 523 Norton automatic washer; middlings to be crushed and retreated along with hand-pickings from ROM; ¼x0 to be dried in a McNally Carpenter centrifugal drier; complete washed-coal-classifying facilities to permit loading and mixing of 4x1¼, 1¼x⅜ and ⅜x0; plant complete with water-clarification and handling facilities; portions of existing structure to be retained.

**Rochester & Pittsburgh Coal Co., Ernest mine, Ernest, Pa.**—Contract closed with McNally Pittsburg Mfg. Corp. for one McNally Pittsburg drier addition for handling 50 tph of ¼x0, complete with McNally Reintjes furnace and McNally Pittsburg overfeed stokers; erection by coal company.

**Courtesy Coal Corp., Manchester, Ky.**—Contract closed with McNally Pittsburg Mfg. Corp. for 300-tph raw-coal tipple, consisting of four-grade raw-coal shaking screens, mixing conveyors and loading booms.

**Ridgeview Coal Co., Ridgeview, W. Va.**—Contract closed with McNally Pittsburg Mfg. Corp. for one No. 2030

# MACK TRUCKS ... for All-Out Effort

● Today's all-out effort in National Defense and civilian supply places an ever-increasing strain on truck equipment. Fact is, up to 75% of all incoming and outgoing materials at the nation's defense plants are now hauled on motor trucks.

Under such emergency conditions "Built Like A Mack" takes on added significance . . . means trucks that stand up better under the punishing wear and tear of bigger loads and more intensive service.

Wherever they operate . . . in whatever phase of the national economy . . . Mack trucks have one thing in common. Being Macks—they're built to outlast them all—to give *long-lasting* economy and reliability. That's a basic Mack advantage, vitally important during periods of uncertainty when replacements may be difficult to obtain.

Your nearest Mack branch or distributor has the right Mack for your particular line of business—a truck that's built better to give you benefits in low-cost maintenance and peak performance for many years to come.

Mack TRUCKS

**. . . outlast them all**

Mack Trucks, Empire State Bldg., New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Rigorous mining service is one more job where Mack trucks show at their best in extra strength and stamina, extra performance and extra dependability.

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DIFFERENTIAL MANTRIP CARS

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NEED NOT BE SACRIFICED

## DIFFERENTIAL HAS ALL THREE

From the reinforced ¼" steel plate roof to the smoother running axless trucks, no detail of safety and comfort, consistent with economical construction and operation has been overlooked.

Safety and comfort such as are found in these cars are being translated daily into greater production because of resulting employee goodwill.

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The new improved Flexipipe is efficient, serviceable and economical. It's made in a variety of diameters and lengths and with various accessories to take care of your individual requirements. Write us for complete information and sample.

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McNally Norton unit washer addition to process 75 tph of 5x¼; installation to be handled by Kanawha Mfg. Co.

**Eastern Coal Corp., Stone, Ky.**—Contract closed with McNally Pittsburg Mfg. Corp. for heavy-media washer addition to No. 8 raw-coal preparation plant to handle coal from Mines Nos. 7 and 8; entire ROM crushed to 5x0 and prescreened at ¼ in; 5x¼ to be cleaned in two 9-ft McNally Tromp dense-media baths at the rate of 350 tph; washing addition is complete with McNally Tromp automatic density controls, rinsing and slurry screens and magnetite-grinding unit.

**Guyan Eagle Coal Co., Mine No. 4, Stowe, W. Va.**—Contract closed with McNally Pittsburg Mfg. Corp. for McNally Norton automatic washing addition to existing raw-coal headhouse and conveying installation to wash present 240 tph of 6x¼, plus approximately 50% of the ¼x0; provision made for installation of additional dewatering and drying equipment that will permit washing of entire 270 tph of 6x0; plant complete with water-clarification facilities.

**Maumee Collieries Co., Mine No. 28, Jasonville, Ind.**—Contract closed with Robert Holmes & Bros., Inc., for two Baughman Verti-Vane thermal coal-drier units; total wet feed to drier units, 90 tph of 1-inx28-mesh washed coal from dewatering screens; moisture reduction of 7 to 8% expected.

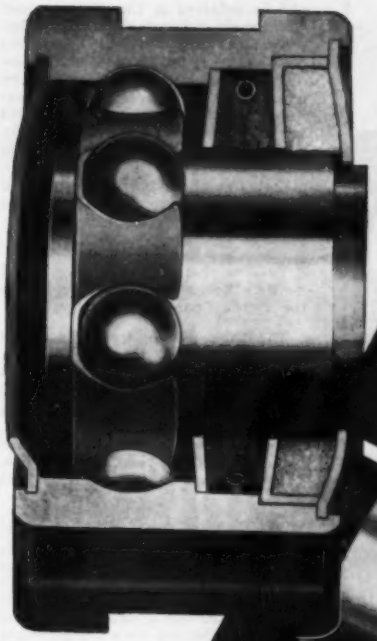
**Atlantic Crushed Coke Co., New Derry, Pa.**—Installation by Deister Machine Co. of one Deister No. 16 Plat-O coal-washing table to treat ⅛x0; feed capacity, 15 tph.

## New Developments

**Crucible Steel Co. of America** is planning installation of modern trackless mining equipment at its Crucible, Pa., coal mine in Green County in a move to increase its output of metallurgical coal. As a part of a $27,250,000 program to expand steel-making capacity at its Midland, Pa., works, the company will install trackless cutting machines, loaders, drills and transportation equipment and improve and enlarge power and mine-service facilities. A new diesel towboat, the "Crucible," will go into service this spring hauling coal barges to the Midland works.

**Under its new 30-yr contract** with the Commonwealth Edison Co., Peabody Coal Co. is required to build two new mines at its coal properties in Christian County, Illinois, the company announced last month in reporting stockholder approval of the issuance of a new series of 160,000 shares of non-convertible 5½% prior preferred shares with a total par value of $4,000,000. Issuance of the new stock

# M-R-C
## CONVEYOR ROLL BEARINGS



M-R-C Strom SRB Gurney Ball Bearings

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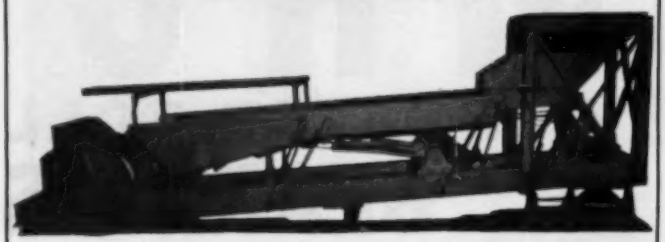
**MARLIN-ROCKWELL CORPORATION**

Executive Offices: JAMESTOWN, N. Y.

# PORTABLE
# COAL PREPARATION UNITS



*(Patent Pending)*

• Comprised of hopper, feeder, screen, picking table and single roll crusher. Capacity—125 or 150 tons per hour. Large heavy-duty Timken double-row roller bearings in the eccentrics and pillow blocks. Over-size Torrington spherical roller bearings in the crusher. The crushers are adjustable from ¾" to 10" opening. Screened coal over the picking table is diverted by a flap-gate to the crusher or mixed with the slack for mine-run. The screen has a snappy action, resulting in efficient screening.

The picking table has a smooth motion which allows selective picking of the impurities which are disposed of in the trough running over the center of the picking table.

The unit is equipped with magnetic starters and push-button controls, 10 to 15 HP motor on the crusher, 5 HP motor on the screen and picking table. It can be readily transported from one location to another on a standard long-wheelbase truck, with minimum cost for moving and erecting.

When used in conjunction with a belt or chain conveyor, the unit can be adapted to various arrangements for handling the coal from the trucks or mine cars, through the cleaning unit, to the railroad cars or bins.

The use of oversized anti-friction bearings throughout these two unit sizes insures trouble-free operation, with low power and maintenance costs.
*Full information upon request.*

{ *Also* — SINGLE ROLL COAL CRUSHERS • • • SHAKER FEEDERS • • • BELT CONVEYORS }

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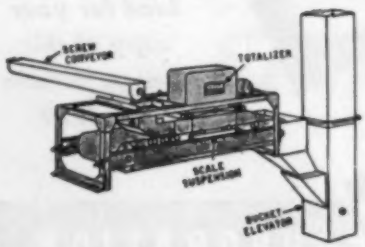


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Automatically and continuously transports, weighs, indicates, integrates and totalizes tonnage.

**SINTERING MACHINERY CORP.**
Transportometer Division

**70 PINE ST.**
New York 5, N. Y.


will be deferred at this time because of "current unfavorable stock-market conditions," the company said. Proceeds of the $6,000,000 debenture issue currently being negotiated also will be used to finance the company's expansion plans. The new agreement with the utility calls for Peabody to supply between one-half and two-thirds of its coal requirements (*Coal Age*, April, p 134). One of the new mines required is already under construction and the second is to be in operation by October, 1954.

**The Daugherty Coal Co.** has leased its Hazelkirk mine, Finleyville, Pa., to the Horne Coal Co., Smithton, Pa.

**The Kaiser Steel Corp.** has awarded a contract to the Centennial Development Co., Eureka, Utah, for driving a 1,500-ft haulage tunnel designed to open up some 30 million tons of coking coal in its reserves at Sunnyside, Utah. The tunnel, scheduled to be completed by the end of the year, will be driven through rock, 9 ft high and 12 to 15 ft wide.

**The Richland Mine** of the Costanzo Coal Mining Co., Warwood, W. Va., was closed April 3 because of what was reported as "general conditions." Opened in 1885, the mine employed 300 men and had a daily capacity of 1,800 tons. "It is a very old mine, and old mines are expensive to operate," company officials said. The company expects to continue operation of another mine in the vicinity, it was reported.

**The newly organized Paragon Jewell Coal Co.**, was expected to open its new drift operation this month. Located in Buchannan County, Virginia, the property will have a daily capacity of 2,000 tons, with reserves estimated at 15 million tons of Jewell seam coal. The mine will ship via the N. & W. and will have complete facilities for washing and oil-treatment of coal. C. A. Clyborne is president of the organization.

**A new coal-washing plant** of the latest design will be built at the Princess colliery in Sydney Mines, Cape Breton, H. C. M. Gordon, chief of coal operations, Dominion Steel & Coal Corp., recently announced. Construction work is scheduled to begin as soon as supplies are available and will be completed in about 4 mo.

### Coal Company Plans Magazine

Stonega Coke & Coal Co., Big Stone Gap, Va., will join the growing ranks of coal companies issuing employee magazines with a news publication edited by and for employees scheduled to make its first appearance this month. Authorized and endorsed by E. B. Leisenring, chairman of the board, the new magazine will be named from employee suggestions. Prizes are being offered for the best name submitted as well as for the best ideas suggested for it.

# CABLES for every mining job

Whatever your requirements for rugged mining applications, you will find tough General Electric cables give you long, reliable service.

Whatever your operation—coal or metal, underground or open cut—you can have the advantage of General Electric's years of experience . . . experience that offers you cables designed for specific applications . . . cables known for their resistance to impact and abrasion . . . cables that are light and flexible, easy to handle—that help to speed up your operations.

For quick reference on G-E mining cables, write for your copy of a handy new booklet, "General Electric Wire and Cable for the Mining Industry". And remember, General Electric cable engineers, specialists, and distributors are always ready to assist you in planning for special-purpose as well as standard cables.

*You can put your confidence in—*

**GENERAL ELECTRIC**

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- **Power Distribution Cable**
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- **Mine Telephone Cable**
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- **Magnet Wire**
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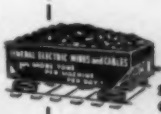
***get this 24-page fact-filled booklet, with descriptions, and selection data for all types.***



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Please send me a free copy of "General Electric Wire and Cable for the Mining Industry."

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***We'll see you at the Cleveland Coal Show!***

# Don't Let IRON and STEEL SCRAP Gather Cobwebs!

Somewhere, back in a corner of your plant or shop, there's some scrap iron and steel. Maybe quite a pile, gathering rust. Maybe some obsolete machinery, long unused. Maybe odds and ends that total many tons. You've meant to have it hauled away, but somehow it's still around.

***Now's the time to sell it!***

Call the nearest scrap dealer; ask him to give you a price. He'll pay good money for it. Prices are high . . . the nation's steel plants need scrap badly. With a stepped-up defense program under way, scrap is more than ever a vital ingredient of steel production. Industry must help take up the slack—*fast*.

A constant flow of scrap means greater tonnages of iron and steel. It means more finished products made of iron and steel. You can help . . . and help yourself as well. Get that scrap in circulation. Get it on the job!

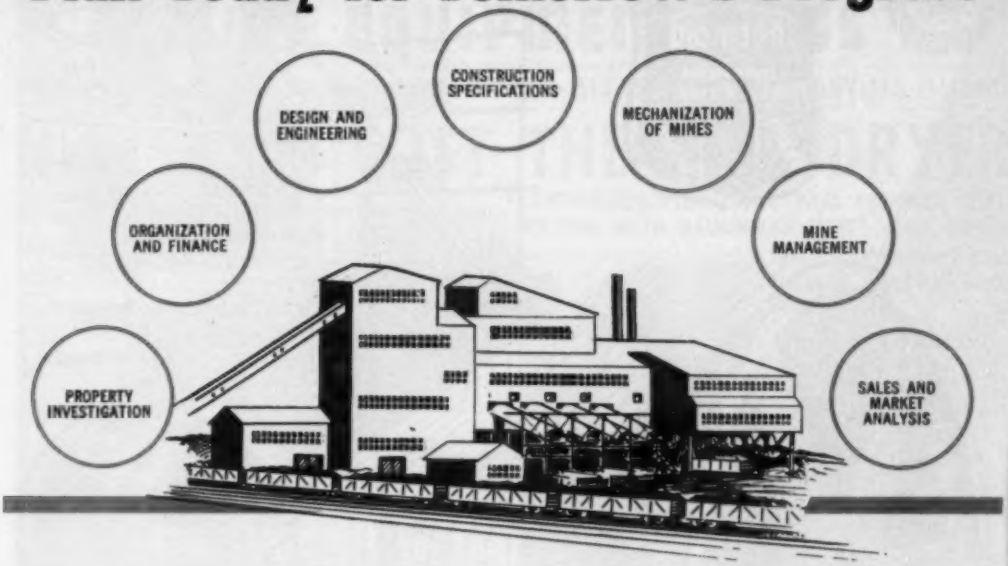
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

**BETHLEHEM STEEL**

BETHLEHEM STEEL

If you don't know the name of a scrap dealer, look one up in the yellow classified pages of the telephone directory. You'll find a listing there.

# Plan Today for Tomorrow's Progress




SINCE 1917, this organization has provided mining engineering and management services to coal and metal mining companies in twenty-nine states and twenty foreign countries. The service has covered anthracite, bituminous, and lignite mines, and eighteen different types of ore properties.

This continuous service has been made possible by a recognition of meritorious performance both on a national and international basis.

That is our business, and we specialize in it. Here, at your service, is an organization of practical engineers and operating men who know the complex problems of the mining industry from actual practice. Their mature judgment and skill which comes from such wide-spread activities can be focused upon your problems so that difficult executive decisions may be made with assurance.

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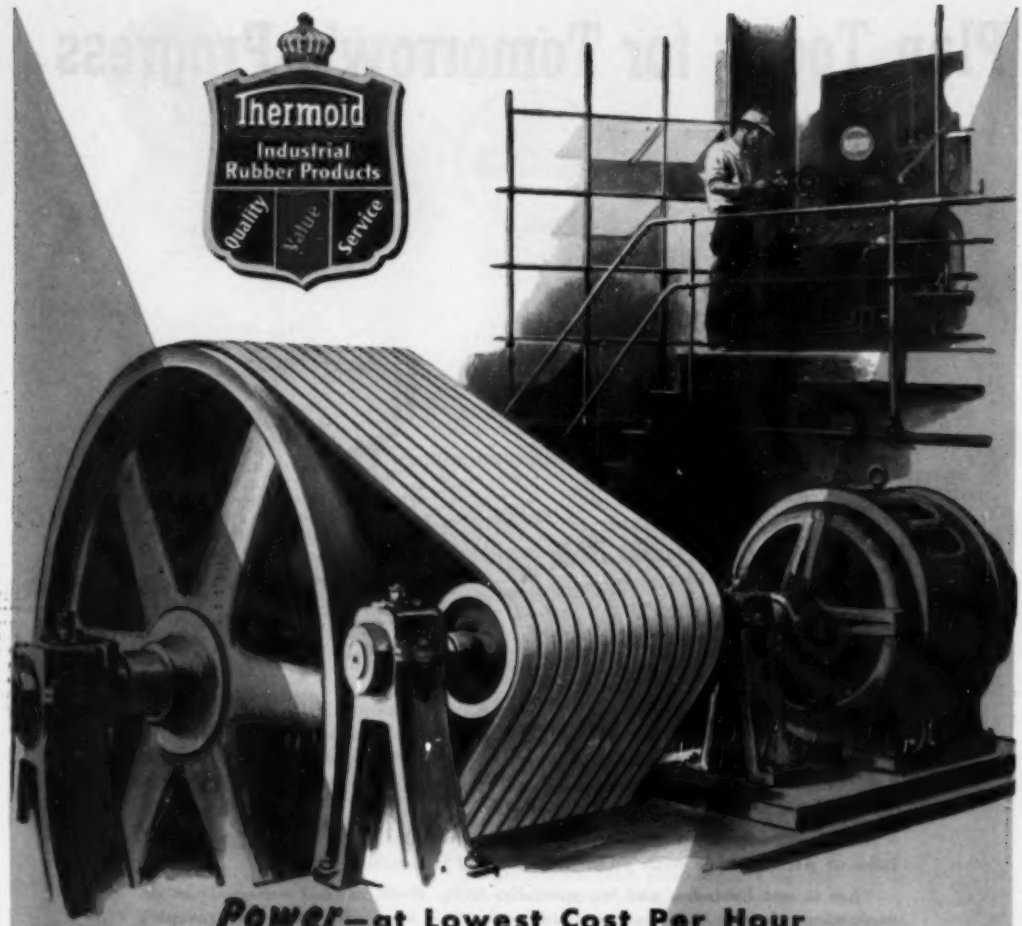
SCRANTON ELECTRIC BUILDING

**SCRANTON 3, PENNSYLVANIA**




**Power—at Lowest Cost Per Hour**

**with Thermoid Multi-V Belts**

Thermoid Multi-V Belts are pre-stretched to insure maximum power transmission without adjustment. They are constructed for flexibility and ability to absorb repeated shock loads . . . thoroughly impregnated with special rubber compounds to withstand moisture and abrasion, resulting in longer belt life.

Thermoid Multi-V Belts are available in matched sets—uniform in size and cross section. Their longer life and non-slip performance add up to "Power—at the lowest cost per hour."

Your Thermoid Distributor can help you with your power belting problems—whether you need Multi-V, F.H.P. or flat transmission belts. For unusual belt problems, a Thermoid Field Representative is always available to give you the benefit of his experience.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

# Holmes MINE EQUIPMENT NEWS

PUBLISHED BY ROBERT HOLMES and BROS., Inc. • 510 JUNCTION AVE., DANVILLE, ILLINOIS

# NEW LOW-COST THERMAL DRYER

## NEW DUSTLESS LABORATORY CRUSHER NOW AVAILABLE

Designed to crush coal samples for testing. Produces samples of uniform size for constant and accurate analysis. Holmes' Laboratory Crushers feature easy accessibility to crushing chamber for cleaning, replacing hammers, and changing screens. Rubber seals eliminate dust leaks. High crushing rate, low initial and operating costs are outstanding.

## Automatic Dust-O-Lator Removes Dust and Fines When Loading Trucks

Self-contained units, combining a withdrawal gate, mechanical screen, and automatically controlled power unit, that are adaptable to any type bin for loading trucks. Available for side or bottom discharge. In the Holmes Dust-O-Lator the screening action is positive-automatic—screen motion starts when gate is opened and stops when gate is closed. Models in various sizes for handling egg, nut and stoker coal, as well as lump or run-of-mine sizes.

## CUSTOM-DESIGNED SKIPS AND CAGES FOR FASTER LOADING AND DUMPING

Designed and built to suit your requirements, Holmes Skips and Cages can save you time and money. The 464 cu. ft. Over-turning-Type Skip Bucket, pictured below, was custom built to meet one mine's specific needs. An inquiry, describing your problem, will bring a Holmes engineer to give you the benefit of their 71 years experience in mine equipment.

## AVOID COAL BREAKAGE WITH HOLMES LOWERING SPIRALS

Designed to take the material from the conveyor and carry it gently to the bottom of the bin or silo, Holmes Lowering Spirals keep the product true in size and minimize degradation. Regardless of the distance material travels, its velocity remains uniform; reaching the bottom in a continuous, even stream—sliding onto the peak of the pile without droppage.

## CONTINUOUS-FLOW, ONE-PASS THERMAL COAL DRYING WITH BAUGHMAN VERTI-VANE DRYER

Above cut-away view of Baughman Verti-Vane Dryer shows how continuous flow of coal assures thorough drying, with a minimum of degradation, in a one-pass operation.

### Uniform, Controlled Drying For Large and Small-Scale Operations

Outstanding in price performance, Baughman Verti-Vane Dryers give the best in high-quality operation with comparatively low initial cost. Each unit designed for capacities ranging from 15 to 75 tons per hour, and will handle all coal sizes from 1¼" down—reducing surface moisture to approximately 2% in a "one-pass" operation—delivering a uniformly dried and well mixed product with practically no degradation. Multiple unit installations are recommended for large-scale operations. Simplicity of design, rugged construction, a minimum of moving parts, and slow operating speed tend to eliminate shift breakdown and keep replacement costs to a minimum. Controls easily adjusted to feed conditions. Write for Catalog No. 101.

## HOLMES TO REVEAL New Mining Equipment

In Space 2406 - 2408 at A. M. C. Coal Show CLEVELAND May 14 - 17

ROBERT HOLMES & BROS., INC.
A-7 JUNCTION AVENUE, DANVILLE, ILLINOIS

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For Efficient Sizing of Test Samples

SYNTRON

"Vibrating"

TEST SIEVE SHAKERS

Use standard 8" Sieves. Controlled amplitude of vibration.

A reset timer for accurately timed test periods.

Operation from 110-60 A.C.

*Write for catalog data.*

SYNTRON COMPANY

875 Lincoln Homer City, Pa.

THE NEW RIVER CO., Skelton, W. Va.—M. E. Gillespie (left), superintendent of Skelton and Sprague mines; E. D. Hawks, night mine foreman; and R. F. Johnson, general mine foreman, Skelton mine.

# Among the Manufacturers

**Paul Reeves** has been named director of sales, Timken Roller Bearing Co., Canton, Ohio. With Timken since 1929, Mr. Reeves has served in various sales posts and has been advertising manager since 1943.

**Link-Belt Co.**, Chicago, has elected as a vice president, Robert C. Becherer, with the company since 1923 and general manager of its Ewart plant in Indianapolis since 1947. A dividend declared late in March marks the 75th consecutive year of an unbroken dividend record since the incorporation of the founding company, Ewart Mfg. Co., in 1875, Link-Belt reports. Richard Moyer, formerly general superintendent at the Pershing Road plant in Chicago, has been appointed general manager of the North Central division, with headquarters in Minneapolis, succeeding Leslie J. Carson, who has accepted the position of price executive of Machinery Branch of the Industrial Materials and Manufactured Goods Division of OPS, Washington, D.C. Fred B. Skeates, previously personnel manager at the Pershing Road plant, has been appointed general superintendent to succeed Mr. Moyer. Harry G. Andersen, formerly district sales engineer at Milwaukee, has been appointed Link-Belt district manager at Birmingham, Ala., succeeding J. T. Bell, Jr., who has been called back into the service with the U.S. Army Engineers.

**J. R. Lewis** has been appointed assistant general sales manager, Quaker Rubber Corp., Philadelphia, a division of H. K. Porter Co., Inc. Mr. Lewis has been with Quaker since 1940 having held positions as Philadelphia district sales manager and assistant sales manager.

**Russell C. Vance** has been appointed district manager of coal for the Pittsburgh sales office of the Joy Mfg. Co.,

SAVE ON CABLE MAINTENANCE WITH RUBEROID'S 7 BIG COST-CUTTING FEATURES

You are assured of a longer, more economical life for your cable with Ruberoid Insulating Tape. A leader in cable maintenance for more than half a century, it does more than just "patch" a cable splice. Equally adhesive on both sides, Ruberoid Insulating Tape strengthens your cable with such vise-like power that you can drag your cable anywhere with complete safety. And only Ruberoid gives you all seven of these money-saving features!

- Double grip . . . both sides adhesive
- Great tensile strength . . . tough
- Won't tear, ravel or pucker
- Resists abrasion
- Acid and alkali-proof
- Extra thick . . . one layer insulates
- Exceeds A.S.T.M. specifications by 300% in adhesiveness, 26% in tensile strength, 290% in dielectric strength.

The RUBEROID Co

EXECUTIVE OFFICES: 500 Fifth Avenue • New York 18, N.Y.

MORE YEARS FOR YOUR DOLLAR WITH RUBEROID BUILDING MATERIALS

# You have a Date with us

# MAY 14

***See the newest developments in Centrifugal Coal Dryers***

**BOOTH 2107**

**1951 COAL CONVENTION EXPOSITION**

**CLEVELAND**

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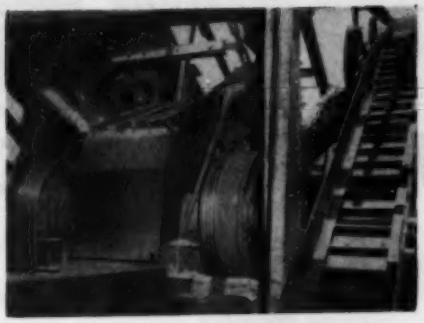
CENTRIFUGAL
DRYERS

**CENTRIFUGAL & MECHANICAL INDUSTRIES**

146 PRESIDENT STREET ST. LOUIS 18, MO.

**Eagle Coal Crackers**

- **Cut cost!**
- **Increase production!**



- **Make fewer fines!**

**Firm Coal—easily fractured coal—east or west Kentucky — West Virginia — Pennsylvania — Illinois — Alabama — it's all the same to an Eagle Coal Cracker. Easily turns out 20 to 50 tons per hour, depending on firmness and size of lump fed. Handles mine run lumps 8" to 10". Reduces to ⅜" to 1-¾" or 1-¾" to 2-¾" depending on gearing. Stationary or portable models. Minimum power required—low maintenance cost. Send for Bulletin 649.**

SINCE 1872 Progress...Service

**OLSON SELF DUMPING MINE GAGES AND STOKER COAL CRUSHERS**

**EAGLE IRON WORKS**

181 Holcomb Ave. Des Moines, Iowa

the HEART of *trouble-free* COAL WASHING SYSTEMS!

**NAGLE PUMPS**

**There are dozens of types of pumps — hundreds of pump manufacturers — but Nagle Pumps are designed solely for the dirty, gritty, abusive jobs. Quickly dismantled and reassembled. Abrasion resistant water end. Impeller to fit the job. Easy to get at stuffing box. Quick slippage seal adjustment. Choice of motor mountings. Maintenance man's dream come true. Many in use in coal preparation plants. Send for Cat. 4906.**

4" Nagle Type "T" Pump in operation in a West Virginia heavy media float and sink coal preparation plant.

*Nagle Pumps*

INDUSTRIAL PUMPS FOR ABUSIVE APPLICATION

1237 CENTER AVE., CHICAGO HEIGHTS, ILL.


succeeding the late Henry Thies. Mr. Vance began his mining career at the age of 14 at the Zeigler (Ill.) mines of the Bell & Zoller Coal & Mining Co. After 7 yr he joined the Cardox Corp. and was promoted to plant superintendent and assistant district manager before leaving in 1941 to join Joy as a sales engineer. He was appointed assistant district manager of Joy's Pittsburgh sales office in 1947.

**George C. McMullen**, vice president, Tyson Bearing Corp., Massillon, Ohio, retired April 1 after nearly 19 yr of service with the company. Active in the tapered-roller-bearing industry for almost 35 yr, Mr. McMullen is a member of the ASME, Society of Automotive Engineers and the Roller Bearing Engineers' Committee of the Anti-Friction Bearing Manufacturers' Association.

**Osmose Wood Preserving Co. of America, Inc.**, Buffalo, N.Y., has named Harold G. Burke a representative supervising its treating operations in southern West Virginia and eastern Kentucky with headquarters in the Charleston area. Mr. Burke is a forestry graduate of West Virginia University.

**Chester W. Schweers** has been named director of sales of the general machinery division, Allis-Chalmers nounced. Officers and directors of the Mfg. Co., Milwaukee. Mr. Schweers, who has held various sales posts during his 20 yr with the division, has been manager of the New England region since March, 1950. Stanley E. Bovim has been named manager of a new branch office of Allis-Chalmers' general machinery division in Peoria, Ill. With the company since 1923, Mr. Bovim has been in the Chicago district office as a sales representative since 1933. F. D. McGuire, Jr. has been transferred from the Chicago district office to the new Peoria branch as sales representative.

**Mark W. Cresap Jr.**, management consultant, has joined Westinghouse Electric Corp., Pittsburgh, as a vice president and assistant to President Gwilym A. Price. Mr. Cresap is a cofounder of the New York and Chicago management-consultant firm of Cresap, McCormick and Paget.

**Formation of Machinery, Inc.**, to specialize in the sale, service and rental of heavy construction equipment and supplies for the mining, construction and other fields recently was announced. New firm include: O. W. Robinson, president, associated with the West Va. Mine supply Co., Charleston, W. Va.; W. T. Coleman, vice president and general manager formerly with the Baldwin Machinery Co., Charleston; and C. K. Payne, secretary-treasurer, owner of the Engine Sales & Service Co., Inc., Charleston. The company is located at 919 Virginia St., E., Charleston. Directors also include James S. Rodney, E. W. Allen and M. K. Gaines, associated with West Va. Mine Supply Co.; and Preston A.

# Permissibles

## THAT GIVE THE MOST FOR YOUR DYNAMITE DOLLAR

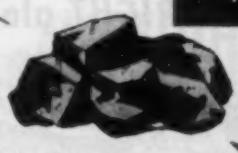
One of the permissibles on the Hercules list will shoot your coal the way you want it, and make every dollar you spend for explosives go further. Let Hercules help you to select the permissibles best suited to *your* coal and working conditions.

**FOR ROCK WORK**

COLLIER®C
RED H®B
HERCOGEL®A
HERCOGEL 2

**FOR WET WORK**

HERCOGEL A
HERCOGEL 2



**FOR COARSE COAL**

RED H C
RED H D
RED H F
BITUMINITE®D
RED H A
RED H L

**FOR FINE COAL**

COLLIER C
RED H B

*HERCULES POWDER COMPANY* 936 King Street, Wilmington, Delaware

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That's right! The last two world's records for efficient production were made in Trolleyphone-equipped mines. Femco's push-button supervision helped modernize these mines. Coal out-put goes up, costs go down with this clear two-way, instant contact between mine-mouth and face, dispatchers and moving motors anywhere.

**"For better Coal Control—Trolleyphone!"**

- **Booms coal out-put**
- **Boots costs**
- **Boosts Safety records**
- **Result: Product profits**

FARMERS ENGINEERING
AND MANUFACTURING COMPANY
349 BRUSHTON AVE. • PITTSBURGH 21, PA.

TROLLEYPHONE
"It Speaks For Itself"

Write today for the new D-A folder on current engine lubrication problems and solutions.

D-A LUBRICANT COMPANY, INC. • Indianapolis 23, Indiana


Young, formerly with the Baldwin Machinery Co.

**The Baldwin-Lima-Hamilton Corp.** has announced that the assets and business of the Austin-Western Co., Aurora, Ill., have become a part of its organization. Present management and personnel of the Austin-Western Co. will remain unchanged and will continue to direct the company's operations, including manufacturing, sales and engineering. Certain Austin-Western products will be sent to other Baldwin-Lima-Hamilton plants for manufacturing, premitting the Aurora plant to concentrate on the production of road graders in greatly increased quantities, as well as a new hydraulic crane.

**Erie Mfg. Co., Erie, Pa.,** has elected as chairman of the board, O. F. Merwin who founded the organization in 1942 at the age of 70. R. F. Merwin has succeeded him as president and general manager. During his association with the company, Mr. R. F. Merwin has served successively as sales manager, vice president, and general manager.

**William R. Wilkinson** has been appointed vice president for sales and Kennedy W. Huffine, vice president for production, Johns-Manville Corp., New York. Mr. Wilkinson, general merchandise manager of the Building Products Div. for the past 5 yr, has had 26 yr with Johns-Manville in the sales and merchandising. Mr. Huffine brings to his new post a combination of 26 yr of engineering and production experience with the company.

**Lima-Hamilton Div., Baldwin-Lima-Hamilton Corp., Lima, Ohio,** has appointed Henry Barnhart as general manager of the Lima plant and J. F. Connaughton assistant general manager. Mr. Barnhart, a vice president since 1944, has been connected with Baldwin-Lima-Hamilton and predecessor companies since 1928, becoming general sales manager in 1936. Mr. Connaughton, a special assistant to Walter A. Rentschler, also has been with the firm since 1928.

**Caterpillar Tractor Co., Peoria Ill.,** has promoted C. B. Leber to district representative, contacting Caterpillar distributors in Colorado, Wyoming and portions of Montana, with headquarters in Denver. Mr. Leber formerly was supervisor, sales-development division.

**P. H. Hagen, Seattle, Wash.,** has joined the West Coast sales division of Raybestos-Manhattan, Inc., Passaic, N.J., to represent the company in the Pacific Northwest, with headquarters at 2221 4th Ave., S., Seattle.

**G. P. Foster** has been appointed a district representative for two-way communications equipment of the General Electric Commercial Equipment Div. in the state of Kansas and portions of Missouri and Nebraska, with headquarters in Kansas City, Mo.

# CUT DRILLING COSTS !!!

## BLAST HOLE AND COAL RECOVERY DRILLS

*Heavy*

*Rugged*

*Powerful*

● McCarthy Self-Propelled Horizontal Blast Hole Drills get in and out of tight quarters quickly; adjusts on four individual leveling jacks for proper drilling heights. Excellent for low level work.

● Truck Mounted Horizontal McCarthy Drills are breaking drilling records everywhere! All necessary equipment is carried with the unit — out of the mud at working level!

● Here's a Vertical McCarthy Unit on a Half-Track. Compact construction makes McCarthy Drills perfect for all mountings . . . truck, half-track, cat, jumbo or other special rigs.

## McCARTHY DRILLS

● If you haven't already seen a McCarthy at work, we suggest you see one quick!

These rugged, powerful units have gained universal acceptance as the most efficient machines ever made for drilling blast holes. Furnished with gasoline, electric or diesel power.

Extra heavy construction relieves you of maintenance troubles. They're versatile, fast, economical machines capable of 50% more productive service than any drill you might now be using!

Write Salem Tool today for full facts. Also ask about McCarthy Coal Recovery Drills — the machine that's being acclaimed in so many trade journals for its remarkable ability to reduce mining costs.

*DRILLING EQUIPMENT SINCE 1901*

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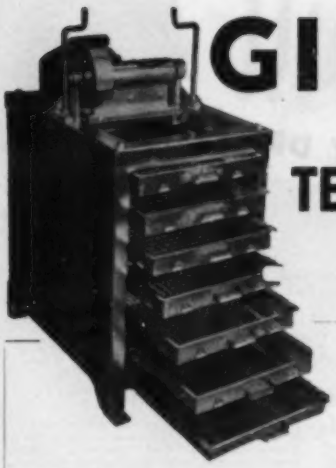
SALEM **THE SALEM TOOL CO.**



# GILSON

## *Mechanical*

# TESTING SCREEN

**WITH EITHER ROUND OR SQUARE OPENINGS**

1. Makes tests quickly and accurately.
2. Two to seven separations simultaneously
3. Screen trays independently removable.
4. Trays balanced to same weight.
5. Visible separation to refusal.
6. Few moving parts to wear out.
7. Engineered for long, efficient service.

Be sure to specify screen sizes in which you are interested when inquiring about the GILSON testing screen.

These are a few of the features that provide a controlled and truly guaranteed product through the use of a GILSON Testing Screen.

**GILSON**

**SCREEN COMPANY · BOX 186 · MERCER, PENNA.**

# How deep is the overburden?

Why guess when these low-cost, easy to operate Acker LD Core Drills tell you

**Quickly!**

**Easily!**

**Inexpensively!**

1. Quality of Coal
2. Thickness of Seam
3. Depth of Overburden

Model LD powered with a 12HP motor for depths to 300'.

Model LD powered with a 7HP motor for depths up to 150'.

For simplicity of design and operation you just can't beat the Acker LD. We've kept moving parts to a minimum and eliminated all feed gears or screws. (Elimination of unnecessary parts cuts down weight, too—an advantage when operating in isolated locations.)

Our newly designed double tube core barrel retrieves samples even where others fail!

Your choice of power and mounting.

Write today for prices and Bulletin 21CA

**ACKER DRILL CO., INC.**

SCRANTON 3, PA.


**Cutler-Hammer, Inc.**, Milwaukee, has opened a sales office at 120 E. 3d St., Charlotte, N.C. The office will be operated as a branch of the company's Atlanta district sales office and will be staffed by Frank A. Miller, Jr. and C. Lee Shaw.

**The Marion Power Shovel Co.**, Marion, Ohio, has appointed Ingenieria Mecanica y Electrica S.A., Mexico City, distributor for the entire Marion line in Mexico. Partners in the firm are Gregorio Morales Garza, Juan Francisco Fournier and Luis E. Lomas.

**A $2,000,000 expansion program** planned by the Union Wire Rope Corp. for its plant at Kansas City will increase its space and pay roll 25%, according to an announcement by M. G. Ensinger, president and general manager, who said that part of the space will be devoted to equipment and facilities that will increase the wire-mill output 66%. The five major building projects in the program—plus one which only recently has been completed and occupied—will add a total of 109,000 sq ft to the plant facilities, for a total of more than 500,000 sq ft under roof. One of the buildings, an administration and production-control unit with 26,000 sq ft, already is under way and is expected to be completed by the spring of 1952.

**Carlon Corp.**, Cleveland, Ohio, has announced establishment of a new Carolina Div. in Asheville, N. C., as part of a planned expansion program designed to place Carlon manufacturing facilities at strategic locations. The output from the new Carolina plant will be utilized to supply the demand for Carlon plastic pipe in the Southeastern portion of the United States, and to help meet increasing demands throughout the country.

**Worthington Pump & Machinery Corp.**, Harrison, N. J., last month began construction of its 20th manufacturing plant. Located at Succasunna, N. J., the modern one-story facility will be devoted to production of vertical turbine pumps for customers east of the Mississippi and abroad. With E. J. Schwanhausser, executive vice president, presiding at the ceremonies, C. E. Wilson, vice president in charge of vertical-turbine-pump sales, broke the first ground for the plant.

**Moving of the offices and laboratories** of the Burrell Corp. to new quarters at 2223 Fifth Ave., Pittsburgh 19, Pa., has been announced by Guy H. Burrell, executive vice president. The new headquarters is a 5-story steel-and-concrete building that permits consolidation under one roof of all needed facilities for the efficient manufacture and distribution of scientific apparatus and laboratory chemicals required for expanding demands for its products, Mr. Burrell said.

**Straub Mfg. Co., Inc.**, Oakland, Calif., has announced completion of a license arrangement with the engineering firm of Sir W. G. Armstrong Whit-

The 1½ cu. yd. Model HM is the largest of the complete PAYLOADER line and the most powerful wheeled tractor-shovel available. Its four wheel drive and large earth-mover tires gives you fast-action traction on clay, mud or sand . . . provides crawler-like traction at far less maintenance expense, PLUS speed when you want it.

Some of its many applications are cleaning tops of coal veins, feeding stripping shovels, loading trucks, maintaining roads, moving tools and supplies . . . lifting, pushing, carrying. This special tractor-shovel operates easily and maneuvers fast because it has power-boosted steering and full reversing transmission with four speeds forward and four reverse. Double-action hydraulic rams raise and lower the booms and dump and close the bucket with finger-tip effort . . . exert tons of down-pressure for tough digging conditions.

See the Model HM in action and you'll understand why it has made a hit in pits and around tipples, yards and plants. The Frank G. Hough Co., 735 Sunnyside Avenue, Libertyville, Illinois.

**SEE IT AT THE COAL SHOW, BOOTH NO. 1545**

Literature on the big 1½ yd. Model HM and six smaller PAYLOADER sizes, down to 12 cu. ft. bucket capacity, is yours for the asking.

# GUNDLACH COAL CRUSHER ANSWERS SIZING PROBLEM

PEP COAL CO. INSTALLATION
NEW ATHENS, ILL.

- . . . size of the stoker coal can be changed while the crusher is in operation.
- makes a very small percent of carbon
- operates with almost no noise
- no vibrations whatsoever

**A letter from Mr. Walter J. Lehr, of the Pep Coal Company, states—"Since installation of your Gundlach Crusher, our sizing problems are licked . . . you can change size without stopping production . . . makes small per cent carbon . very little noise . . . no vibration."**

**This letter is typical of the many received from satisfied Gundlach Crusher owners.**

WRITE FOR CRUSHER BULLETIN C A

**T. J. GUNDLACH Machine Co.**
**Belleville, Ill.**

*Operators say—"20% MORE EFFICIENT than average Storage Battery Locomotive"*

THE
# GREENSBURG "MONITOR"

*In use by Mt. Olive & Staunton Coal Company, Staunton, Ill.*

**FEATURES**

Double knee-action; better trackability. Floating power; less power consumption. Quick acting footbrake, essential for quick stopping, especially behind loading machines. Brake shoes that follow wheel (due to knee-action). Adjustable Timken Bearings throughout. Husklest transmission in any storage battery locomotive. Never leaks oil. Never add oil. Use regular auto oil; change every 6 months. Strong. Simple Design. Low maintenance. Backed by over 25 years of experience with Storage Battery locomotives.

The Greensburg "Monitor" Type is the first real improvement in storage battery locomotives. ENTIRELY NEW IN DESIGN. Its efficiency and economy have been proved in actual mine use. Operators report 20 to 25% more coal hauled than with other battery locomotive having the same battery capacity. From 6 to 10 ton capacities: track gauges 36" to 56½". Other locomotives from 1½ tons to 10 tons, 16" to 56½" track gauge.

MORE HAULING FOR LESS STORAGE BATTERY CAPACITY

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*Makers of Custom-Built Storage Battery Locomotives*
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worth & Co. (Iron-founders) Ltd., Gateshead-Upon-Tyne, England, for the manufacture and distribution of the complete line of machinery to designs and specifications furnished by Straub in an exclusive territory that includes Great Britain, Eire, Europe, South Africa, India, Pakistan, Australia and New Zealand. This new British manufacturing and sales arrangement overcomes the "dollar-exchange" difficulty in the purchase of Kue-Ken Crushers and other Straub mining machinery, the company reports.

## New Books for Coal Men

### Nationalization in Britain

**British Coal Nationalized**, by Gerhard W. Ditz. Here's an account, written by an American after a year's study in British coal fields, of why the mines were nationalized, what the machinery is, how the plan has worked out thus far, and what problems still lie ahead. Social, economic, production and marketing issues get the full treatment. *92 pp. 6x9-in; paper; $1; The Edward W. Hazen Foundation, 400 Prospect St., New Haven 11, Conn.*

### Safety-Conscious Mining

**Safety Consciousness—An Evaluation**, by Stanley M. Walker. If you really want to cut down accidents, the top men in your company must be genuinely interested in safety. That's the conclusion of a USBM mining engineer after a 5-yr study at 62 mining properties in western, eastern and southern states. Safety consciousness never percolates up from the ranks; it always sifts down from the top. (*See p 108 of this issue of Coal Age for highlights of this study.*) *8 pp. 8x10½-in; paper; mimeo. I.C. 7595, USBM. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

### New ASHVE Guide

**Heating, Ventilating and Air-Conditioning Guide, 1951.** A complete revision with new features. The 50 chapters include human reaction, heating and cooling loads, combustion and consumption of fuels, systems and equipment, special systems, instruments and codes. *1048 pp. Cloth. $7.50, American Society of Heating & Ventilating Engineers, 51 Madison Ave., New York 10, N. Y.*

### Other Books and Booklets

**Buried Valley of the Susquehanna River**, by S. H. Ash. Flooding dangers, involving possible loss of life and damage to workings, in the Wyoming Basin and lower part of the Lackawanna Valley. USBM, Bulletin 494. 8x10¼-in; paper. No price quoted. Supt. of Documents, Government Printing Office, Washington 25, D. C.

**Carbonizing Properties: Pocahontas**

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**Because *Hydraulic* Operation Alone Affords:**

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## COAL MEN ON THE JOB

CHANDLER BROS., Madisonville, Ky.: George Chandler (left) and Baxter Wilbourn, at the company's coal stripping near Madisonville.

---

**No. 6, Davy Sewall, and Fire Creek Coals From West Virginia and Upper and Lower Kittanning and Upper and Lower Freeport Coals From Pennsylvania.** USBM, Bulletin 496. 42 pp. 8x10¼-in; paper. 30c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

**Preparation Characteristics of Some Coals Available for the Synthetic Liquid Fields Industry,** by Thomas Fraser, W. L. Crentz and O. T. Barrett. USBM, Bulletin 495. 132 pp. 8x10¼-in; paper. 50c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

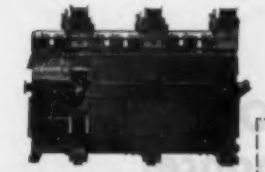
*The following USBM publications, 8x10½-in, paper, mimeo, are available free upon request to Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

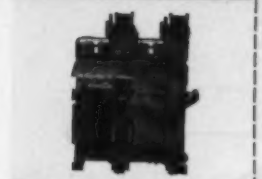
**Treatment of Timber,** S. F. Crawford and J. H. Bird. I. C. 7597. 4 pp.

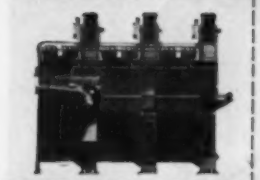
**The Short-Circuiting Contactor As an Electrical Protective Device for Coal-Mine Service,** by L. H. Harrison, R. I. 4759. 11 pp.

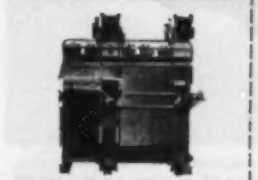
**Synthetic Liquid Fuels—Annual Report of the Secretary of the Interior for 1950.** Four parts, as follows:
Part I—Oil From Coal, R. I. 4770.
Part II—Oil From Oil Shale, R. I. 4771.
Part III—Liquid Fuels From Agricultural Residues, R. I. 4772.
Part IV—Oil From Secondary Recovery and Refining, R. I. 4773.

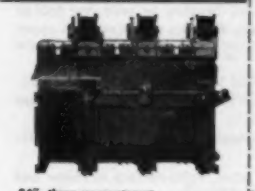
**NEWS OF YOUR ORGANIZATION** is also interesting to others, so why not make it a point to inform COAL AGE of personnel changes among your staff members, mine-development plans and unusual activities.











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Shown below are the three Diaphragm JIGS • • • At the left—60", one compartment; in the center is the 60", two compartment; and the Unit Washer at the right.

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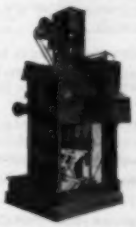

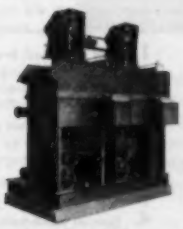

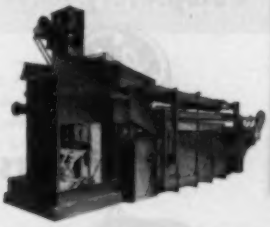

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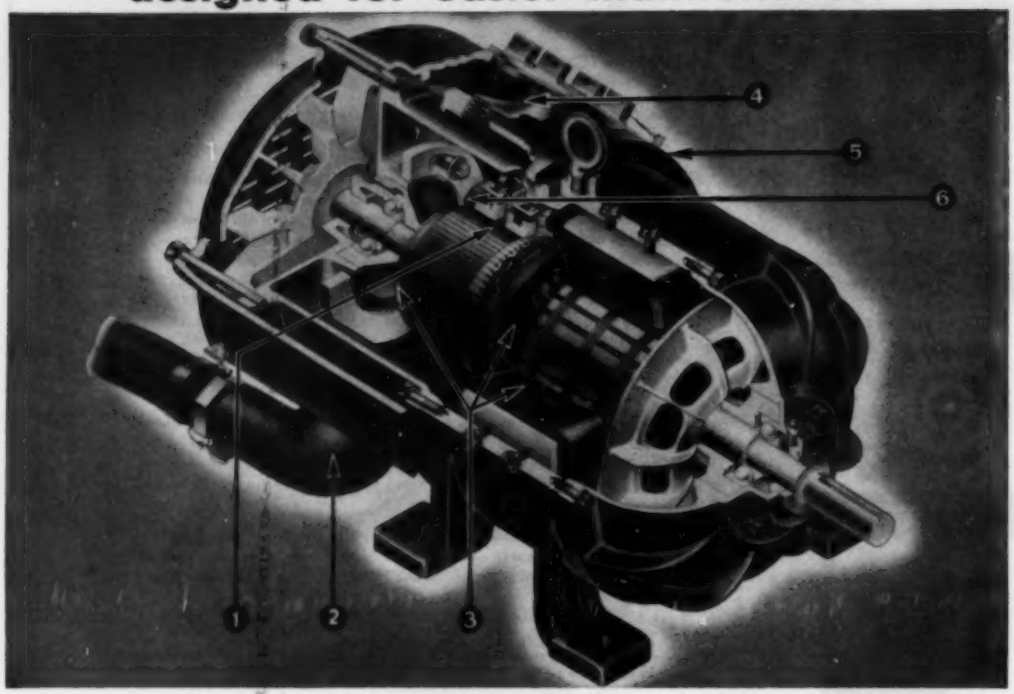


## Completely NEW!

## DC mine Motors

Explosion-proof, listed by U.S. Bureau of Mines, for any underground mining use

Here's the completely new General Electric d-c mine motor—with all the convenience features operators and mining-machinery manufacturers told us were wanted most! And here are just six out of 21 reasons why it's so *much* easier to inspect and maintain, longer-lasting, easier to install:

1. **New two-stud brush construction** permits locating all brushes on only one half of commutator, eliminating need for access from four sides. Brushes are located on upper half unless otherwise requested. Brushes are easily accessible through two large hand holes located directly above brushes.

2. **Removable cable gland,** plus generous-length internal leads with convenient terminals, make it easy to replace cable right in the mine, without dismantling motor. Gland does not project beyond diameter of the motor.

3. **Moisture-resisting insulation** minimizes effects of moisture absorption which frequently causes mine-motor insulation failures.

4. **Special hand-hole cover design** lets ventilating air wipe entire surface of frame and end shield, assures adequate cooling. Screw-in-type cast bronze cover with sturdy lugs needs no special tools for removal.

5. **Sturdy fan housing,** of shock resistant cast-iron, is easily removed to clean air chamber. Machined fits assure its accurate alignment and rigid mounting.

6. **Brush-holder stud insulation** is made of mycalex, a glass-bonded, inorganic, non-tracking mica. Steel brush holder yoke will not chip or crack.

**New booklet tells whole story!** *All* the many advantages of this new, easier-to-maintain G-E mine motor—in ratings from ½ to 60 hp—are described in Bulletin GEA-5553, just off the press. Ask your G-E representative for *your* copy *today*, or write Dept. 663-15, *General Electric Company, Schenectady 5, N. Y.*

**GENERAL ELECTRIC**

663-15

# THE ONE SPIRAL THAT'S BRINGING DRILLING COSTS DOWN

Into the current picture of rising operating costs and general inflationary spirals, comes a new kind of "spiral" that's actually *cutting* mining costs—the Coalmaster Spir-L-Weld Auger.

Because the exclusive Spir-L-Weld process offers a new kind of flight surface, it reduces resistance . . . minimizes clogging . . . lessens power consumption on equipment, and strain on operator. The Hexanspeed Coupling Assembly of the Coalmaster Spir-L-Weld Auger speeds up auger changing time, and has increased productive time at the blast hole by as much as 30%.

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- **The Buda Co.** Harvey, Ill.
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- **Dooley Brothers** Peoria, Ill.
- **Drillmaster Supply Co.** Evansville, Ind.
- **Illinois Powder Mfg. Co.** St. Louis; Salt Lake City
- **Joy Manufacturing Co.** Main Office, Pittsburgh, Pa. Representatives throughout the world
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DRILLING COALMASTER TOOLS

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AUGERS • DRILL BITS • DRILL HEADS • DRILL SOCKETS • WEDGES

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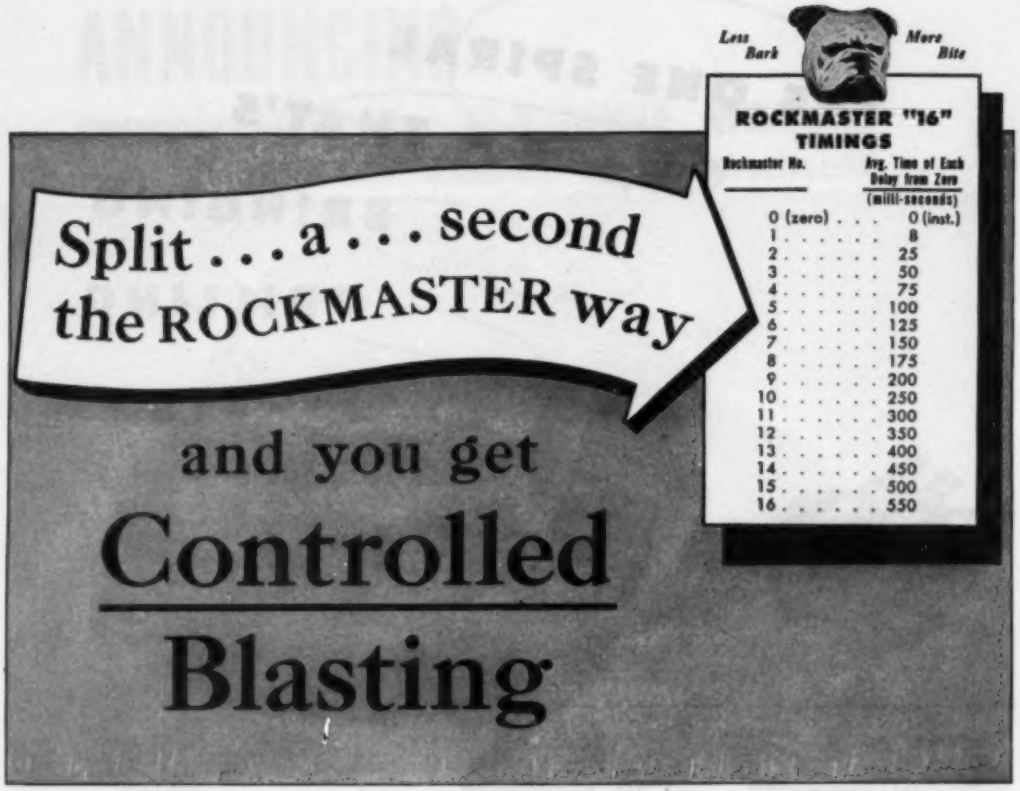
Less Bark
More Bite
ROCKMASTER "16" TIMINGS
Rockmaster No.
Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero) . . . 0 (inst.)
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2 . . . . . 25
3 . . . . . 50
4 . . . . . 75
5 . . . . . 100
6 . . . . . 125
7 . . . . . 150
8 . . . . . 175
9 . . . . . 200
10 . . . . . 250
11 . . . . . 300
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Split . . . a . . . second the ROCKMASTER way
and you get
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THE ROCKMASTER blasting system offers you a choice of *sixteen* split-second delay detonators. Fit the right ones for your job into the complete system—including the correct explosive, drilling pattern and loading procedure—and you've got the key to a smooth flow of blasting power that can mean true

***controlled*** **force . . .** ***controlled*** **throw . . .** ***controlled*** **breakage.**

We help you tailor the system to fit your requirements, often with substantial savings in drilling and dynamite, too.

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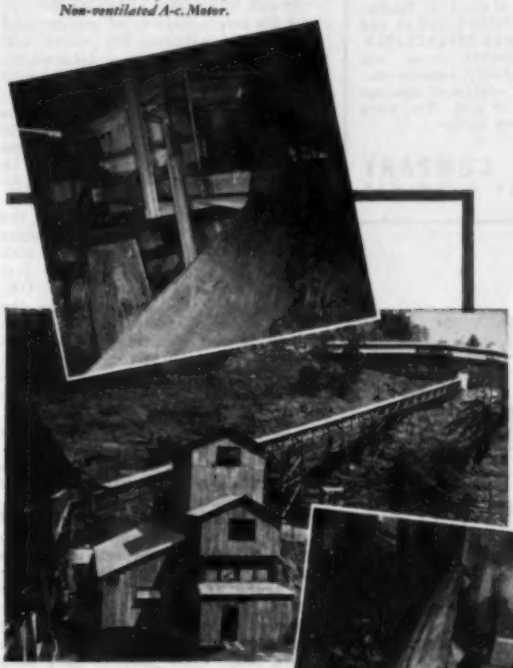
*Reliance PRECISION-BUILT Totally-enclosed, Non-ventilated A-c. Motor.*

## do a *Good* Job on the *Tough* Jobs!



*Reliance two-speed motor (top) effectively regulates volume of coal passed by eccentric feeder onto decline conveyor (right). Movement of conveyor with 12-ton load is controlled by Reliance two-speed motor with integrally mounted brake.*

Wherever coal is mined, more and more operators are discovering that Reliance PRECISION-BUILT A-c. Motors provide the maximum in dependable and economical power on every job above and below ground.

These rugged, long-lived motors applied to shaking and vibrating screens, washers, pumps, air tables, crushers, feeders and conveyors will offer you invaluable assistance in keeping production up and costs down. PRECISION-BUILT Motors are made in all standard enclosures, in sizes from 3/4 to 300 hp. Write today for Bulletins B-2101 and B-2201. For Explosion-Proof Motor data ask for Bulletin C-130.

*See* **OPERATING EXHIBIT** of **RELIANCE MOTOR-DRIVES** at the **COAL SHOW in CLEVELAND**
**May 14—May 17 • Booths 1900 and 2001**

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2. SOFT SPONGE rubber insert, ¾" thick. (Greater comfort for your knees.)
3. TWO WIDE STRAPS. Made of ELASTIC webbing. (Greater comfort for your legs.)
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5. Heavy No-slip Buckle. SPONGE INSERT, STRAP and BUCKLE ARE REPLACEABLE.
6. Both buckle straps and elastic webbing, securely stapled into reinforced openings on sides of pad. (For extra trouble free service.)

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## Foreign Developments

### Large-Scale Modernization Sought to Boost German Output

DUESSELDORF—A program planned to increase West German coal output by 80,000 tpd through an investment of 2,300 million Deutschemarks (approximately $575 million) within 1 yr has been drawn up by the German Coal Mining Administration. Approximately 50,000 tons of the increased output would be secured through investment of 150,000,000 DM for the mechanization of underground mining. In addition, 350 million DM would be spent on surface installations, 300 million on the extension of power facilities and 650 million on other installations such as coking plants. Some 450 million DM would be devoted to speeding up work on new installations already under way, which would be expected to raise daily output by 28,000 tons.

The program also calls for the construction of 100,000 miners' homes at a cost of 1,250 million DM, with 35,000 homes to be built in the first year at the cost of 400 million DM. The project was announced by the head of the Trade Union Economic Institute and a member of the Coal Mining Administration, who warned that the necessary funds could not be found within the limits of the current credit and economic policy.

Insufficient coke supply is one reason for the nation's failure to boost its output of crude steel and pig iron, it was pointed out, and is an important factor in its further economic development. West Germany's 1950 production, of crude steel and pig iron was equal to only 82 and 75%, respectively, of the prewar ouput. If population growth is figured in, pig iron stands at only 62%, of the prewar level and crude steel at 66%, while the manufacturing industry is producing at 130% of the 1936 level. Coke supplies have been continuously declining since October, 1950, it was reported, and consumption of metallurgical coke for March, 1951, was estimated at only 630,000 tons, as compared with 870,694 tons last October.

Output per man-shift below ground increased from 1.43 metric tons in January to 1.47 in February, industry official reported in mid-March. Average daily ouput during February (not including extra shifts) was 377,700 tons, a new postwar high.

The release by the ECA mission at Essen of 1,205,000 marks from Marshall Plan counterpart funds to finance

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WIRE ROPE

Its fitness for tough work has been proved by many years of actual on-the-job performance. Strength, toughness, flexibility, and durability... *in correct balance*... provide safe, dependable, and economical wire rope service.

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Let the Red-Strand be *your* wire rope guide. You will find its reputation justly earned.

Round Strand or Flattened Strand – Preformed or Non-Preformed – Wire Rope Core or Fiber Core. Let us help you select the *right* rope for your job.

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**Cleveland—May 14-17**

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technical projects for the West Germany coal industry also was reported late in March.

### British Use Low-Grade Coal To Produce Water-Gas

LONDON—If successful, work now being done at the Fuel Research Station, Greenwich, may result in the use of low-grade coal now wasted to produce water-gas at a cost as much as 50% less than that presently produced from high-grade coke, it recently was reported. An experimental plan already is working on the conversion of coal-washery slurry now wasted. In the process, steam is passed up through a cylindrical metal retort to react with fine coal heated to incandescence and form the water-gas. The tendency of finely divided fuels to pack so tightly as to prevent their use has been overcome by using the "fluid-bed" technique, in which the process steam is blown in from below at such a pressure that the fines are kept in suspension.

### Freight Rates Boosted on Western Canadian Coal

MONTREAL—Increased freight rates on Western Canadian coal went into effect April 1. Originally announced last year, the increases will run up to $2.35 a ton on coal moving from Alberta and British Columbia to Ontario. A second group of increases of the same amount are to be put into effect a year from now.

The railways have said the double-barreled jump is aimed at bringing back the western coal rate—at a maximum of $8.40 a ton—to normal levels. The rates have been on the existing scale since they were lowered in mid-depression to help keep the western mining industry operating, and the railways contend they do not now meet the out-of-pocket cost of haulage.

The Western Coal Federation, which has been fighting the increase, said that even the first of the two proposed increases would threaten the movement of western coal to Ontario—about 270,000 tons a year—and would adversely affect the whole industry. Western coal now is aided in its eastbound movement by federal subventions up to $2.50 a ton. The government has decided against increasing the scale of this aid, it was reported.

DENMARK—Poland has again raised the price of coal delivered to Denmark under a contract signed last year, according to reports. The contract covered the delivery by Poland of about 2,000,000 tons of coal in 1951. The latest increase is the third under the contract and means that the price has risen 100% since the contract was signed, with most of the coal still to be delivered.

POLAND—Work on the opening of three new coal mines begun last year

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"W" DENTED SHAKER SCREENS

A "must" when it comes to obtaining an efficient job! *Good* because the spreading and collecting riffles give uniform spread of material over the entire screen surface . . turns the top and middle flow of material down in direct contact with the screen . . . gives an increased screening efficiency up to 33% on fine sizes over an undented flat screen.

Comes in Carbon and Stainless Steels and Manganese Bronze. No sag.

*Write us today. We shall reply promptly.*

REMALY MANUFACTURING CO., INC.
TAMAQUA, PA.

REVOLUTIONARY NEW ELECTRIC HYDRAULIC TRUCK HOIST

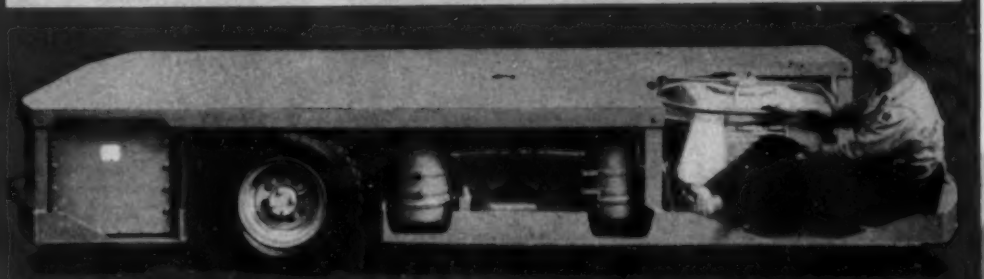
TIMBERLOCK "333"

- Powered by ordinary truck battery.
- Lower mounting—lower cost.
- Dual control in cab and at rear of truck.
- Eliminates power take-off.
- All parts of standard manufacture.
- $366.00 F.O.B. Hastings.

*Send direct for further information.*

TIMBERLOCK CORP.
HASTINGS, NEBRASKA

# NEW Self Propelled Portable AIR COMPRESSOR for MINING Model 275



## See it at ACME MACHINERY'S BOOTH 721

***Especially designed for more efficient and lower cost roof bolting.***

**This model 275 will operate 2-Stopers and 2-Dust Collectors at once with full efficiency.**

***Prominent features:***

1. Exceptionally large air delivery for a portable unit. 275 cu. ft. of air at 100 lbs. discharge pressure.
2. Low overall height — only 27½ inches.
3. 6 inches ground clearance.
4. 15½ ft. long — 72 inches wide.
5. 2 stage — air cooled full forced feed lubrication for heavy duty operation.
6. 2 Extra large oil bath air cleaners especially designed to filter mine dust.
7. Sealed crank case.
8. Mechanical parking brake.

This portable type air compressor is also available in skid mounted-track or rubber non-propelled.

***SALES AGENTS FOR CLEVELAND ROCK DRILLS***

## ACME MACHINERY CO.

BOX 1169 . . . WILLIAMSON, W. VA. • PHONE 2274

Complete MINING FACILITIES
PREPARATION PLANTS
REVERSIBLE FANS
BICYCLE TYPE SHEAVES
SLATE LARRIES
ELECTRIC HOISTS
LET CONNELLSVILLE HANDLE YOUR COAL
From Mine Car to Railroad Car
For almost 50 years, Connellsville Equipment has been foremost in providing the most efficient, complete means of moving coal from the mine car to railroad car, both in the United States and foreign countries. Designed and sturdily-built for rugged, safe operation—Connellsville Equipment can do a maintenance-saving job for you. Why not write for details today!
In addition to the shaft equipment shown, we also manufacture haulages and belt conveyors for slope or drift mining, as well as these trade name products—LEPLEY HOISTING EQUIPMENT, FORT PITT CAR-CAGING EQUIPMENT and YOUGH PUMPS. Consult your McGraw-Hill Mining Catalogue.
ROTARY DUMPS
MINE CARS
TRIP FEEDERS
CAR SAFETY HORNS
SKIP LOADING EQUIPMENT
SUMP PUMPS
BOTTOM DISCHARGE SKIPS
CONNELLSVILLE
MANUFACTURING & MINE SUPPLY CO.
CONNELLSVILLE, PA.
"SERVING THE MINING INDUSTRY SINCE 1901"


## COAL MEN ON THE JOB

RED JACKET COAL CORP., Red Jacket, W. Va.—P. M. Farquharson (left), chief safety inspector, and J. J. Plasky, training and safety director.

will continue this year at five more, the Polish Newsletter reports. The new mechanized mines are each expected to add 6,000 to 10,000 tpd to the country's coal output, beginning in 1953, it said. Housing and community facilities now are being erected in the vicinity of the new mines.

**COLOMBIA**—Extensive coal deposits near Bolombolo, Antioquia, are to be exploited by a group of Medellin industrialists as soon as the highroad leading to the town is completed. The deposits are estimated at 50 million tons and their development is not expected to present any special difficulties as they lie close to the surface.

**SOUTH AFRICA**—A further development in the state-supported plan to extract oil from coal in South Africa is the government's decision to guarantee £18,000,000 to the operating company, South African Coal, Oil & Gas Corp., instead of the £13,000,000 originally intended. This increased money is expected to enable the corporation to increase its production of gasoline and diesel oil to nearly 60,000,000 gal yearly instead of the previous estimate of 35,000,000 gal.

**PAKISTAN** — Recent geological surveys have indicated that the thick black mud exposed for miles along the riverbeds of East Bengal when the waters are low is composed largely of carbon and will burn freely if properly dried. If experiments with this new find prove successful, East Pakistan's search for a cheap fuel might be over, it is reported. The country's annual coal consumption is 1,920,000 tons against its production of 400,000 tons, and coal is being imported from Poland, France, Britain, South Africa and other countries. Geologists now are prospecting an area near Hareshpur, not far from Brahmanbaria, and have found a seam 15 ft or more thick, which indicates some 200 million tons of lignite.

# 92,185,000 TONS OF METALLURGICAL COAL USED IN 1949

Today coal users are becoming more and more critical in their specifications for special purpose coal. For example: "metallurgical coal" requires scientific preparation to produce a coal that can be converted, with minimum loss, into the highest quality coke.

The great expansion of chemical and by-product plants open up new avenues for the sale of premium coals due to the increasing need for more scientifically prepared coal.

*Consult a Fairmont Engineer on the type of equipment to meet the needs of your particular market.*

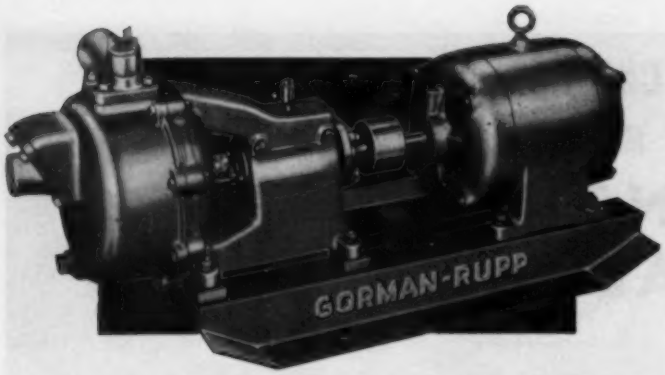
**VISIT US AT THE COAL SHOW BOOTH 1010**

CHANC[illegible] "HEAVY DENSITY" COAL CLEANER

## FAIRMONT MACHINERY COMPANY

FAIRMONT, WEST VIRGINIA

DESIGNERS AND CONSTRUCTORS OF CHANCE SAND FLOTATION PROCESS FOR WET CLEANING AND AMERICAN PNEUMATIC SEPARATOR FOR DRY CLEANING




# GORMAN-RUPP PUMPS
## *SAVE MONEY* in mine operations

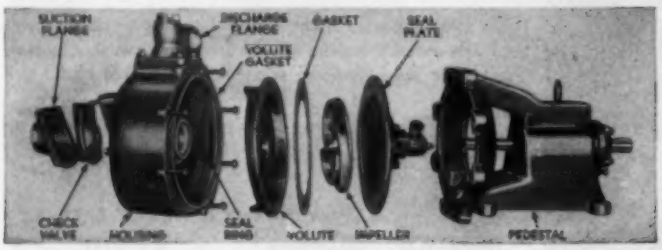
- **They save in maintenance** -- because of their extreme simplicity of design—the impeller is the only moving part. Any wearing parts quickly and easily replaced with common tools.
- **They save costly shut-down time** -- they will run indefinitely requiring little or no attention, are automatically self-priming —ideal for remote location and control.
- **They save 40% pumping costs** -- with the increased efficiency of the Gorman-Rupp design, 3 H. P. does what formerly required 5 H. P.

These pumps are furnished bronze fitted, and all bronze construction.

Gorman-Rupp pumps maintain nearly normal capacity under any working head. They require very low headroom and are efficient and reliable.

SEE THESE PUMPS AT THE MINING CONGRESS MAY 14-17 SPACE-2609 PUBLIC AUDITORIUM CLEVELAND, OHIO

*Write for Bulletin No. O-ME-11*




THE GORMAN-RUPP COMPANY
306 BOWMAN STREET, MANSFIELD, OHIO


## Committe Maps Fight on Industrial Absenteeism

The National Institute for the Reduction of Industrial Absenteeism (NIRIA), New York, has announced the formation of an advisory committee consisting of the following national organizations: Wilcox-Gay Corp., Remington Rand Inc., Johnson & Johnson, National Broadcasting Co., Pepsi-Cola Co., Revere Copper & Brass Inc., Yale & Towne Mfg. Co., Dun & Bradstreet, Whalen Drug Co., Esso Standard Oil Co., McGraw-Hill Publishing Co., Gimbel Bros., Consolidated Edison of New York, Lilli Ann Corp., Mays Department Store, R. H. Macy & Co., and Mutual Life Insurance Co.

Dr. David Bendel Hertz, executive director of the Institute, and professor of Industrial Engineering at Columbia University, presided at the first meeting of the advisory committee. At that meeting, Dr. Hertz stated: "Available data indicates that American industry is today losing more than 10% of its available productive man-hours through all forms of absenteeism. In all probability, the actual loss is much greater. It is the joint responsibility of management, labor and government to sponsor integrated research on this pressing problem. NIRIA has been established to specifically accomplish this purpose in the most direct and practical manner."

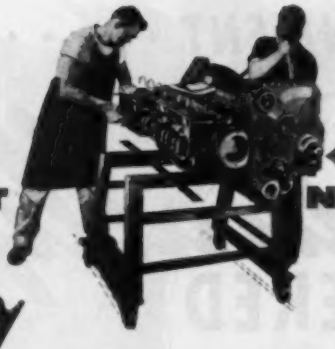
Dr. A. E. Hoag, industrial physician and consultant to the Whalen Drug Co., told the participants that the proposed studies are vitally important to national defense. He said, "It is about time industry started spending some of its money on releasing the tremendous potential energy of the human being that is wasted through avoidable absenteeism."

Prof. Sebastian B. Littauer, professor of Industrial Statistics stated that this is the first time that the industrialists, the statisticians, the engineers, physicians and the social scientists have all joined together to combat the very pressing problem of industrial absenteeism.

A non-profit research organization, the institute will function on a membership basis and will provide an immediate source of data and information on the subject of absenteeism.

Research has already begun on the pressing problem of definitions in the field of absenteeism. It is anticipated that the Institute will formulate the authoritative and standard reference material to be used throughout the world in this field. Participating members will have available its research facilities for specialized investigations. In addition, the Institute will function as a national clearing house for participating companies.

The Institute invites exchange of information from all interested business organizations. Individual research grants are now being arranged whereby the Institute will study the problem of absenteeism in specific industrial firms and work out corrective programs.



BUILT NOT ONCE BUT TWICE

# Cummins®

## CUSTOM BUILT Diesels

Rugged, lightweight, high-speed Cummins Diesels perform better because they're custom-built to *fit each job.* And each engine is actually built twice. Assembled, run-in tested, disassembled, inspected . . . then reassembled and tested *again.* Precision building, Cummins exclusive fuel system . . . efficient service and parts organization, enable users to get peak performance, less "down-time" and *more* rugged, dependable power from Cummins Diesels. *See your Cummins dealer.*

*Lightweight High-speed Diesel Engines (50-550 hp) for:* on-highway trucks · off-highway trucks · buses · tractors · earthmovers · shovels · cranes · industrial locomotives · air compressors · logging yarders and loaders · drilling rigs · centrifugal pumps · generator sets and power units · work boats and pleasure craft

**CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA**

Export: CUMMINS DIESEL EXPORT CORPORATION · Columbus, Indiana, U.S.A. · Cable: CUMDIEX

**Diesel power by CUMMINS**

CUMMINS Diesel

TRADEMARK REG. U. S. PAT. OFF.

# EACH A & G ASSIGNMENT . . . . . .

# *Individually* ENGINEERED

★

**YOUR PROGRESSIVE COAL PRODUCTION PLANS AND REQUIREMENTS RECEIVE SPECIALIZED ENGINEERING**

No past engineering project that we have been commissioned to do becomes a model for the design and construction of your property except in the fundamental engineering.

Each assignment given us is treated in accordance with its own specific problems with good, sound basic engineering to build upon. In no case do we ever sell a "packaged" unit—A&G engineering not only designs and constructs to streamline today's production but in looking ahead to the future, includes flexibility into the operations.

We are an engineering organization exclusively, with no machinery to sell. We do make equipment recommendations because of our experience and purchases are made from various sources accordingly.

A choice of one of two fee plans are available—both being in your favor. One is a flat fee determined at the time of our estimate. The other is one where we go along with you on a small percentage basis figured on the final cost of the project. If the costs are lower or higher than the original estimate, our percentage fee naturally varies accordingly.

*We will contact you at any time that you are ready.*

## Scope of Services

- Design and construction of new plants and their various units.
- Organization, operation and management of mines.
- Below ground modernization and mechanization.
- Reconstruction, revamping, or improvement of existing plants.
- General consulting work regarding power, equipment, operation, and various mining problems.
- Valuations for financing, fire loss, taxation purpose—reports and appraisals.

We work with undivided responsibility to you on a cost and fixed fee basis.

We are not hampered by any connections which might prejudice the true professional engineering approach to your problem.

# ALLEN & GARCIA COMPANY

CONSULTING AND CONSTRUCTING ENGINEERS

332 S. MICHIGAN AVE., CHICAGO 4, ILL. • 120 WALL ST., NEW YORK 5, N. Y.

# "It's A Workhorse"

## For Scalping Big Tonnages of R. O. M. Year After Year

If you could watch this Seco scalper taking nearly 130 tons per hour of R. O. M. and scalping off the big lumps at this Kentucky strip mining operation, you'd know that this equipment is built to really take it! And here's why . . . This and every Seco vibrating screen operates with a fully controlled true circular action . . . the result of Seco's patented Equalizer Assembly. (Note in photo how the sharp, positive whip of this "lively" screen discharges the lumps quickly.) What a performance difference this makes! There's no bobbing . . . no weaving . . . no shaking of the supporting structure . . . no undue stress on bearings or shaft. Instead, smooth accurate screening . . . not just hour after hour . . . but year after year. Get better sized, cleaner coal. Install a Seco "workhorse". Write today!

**SECO**

**TRUE CIRCULAR ACTION**

**VIBRATING SCREENS**

Over 300 Models in Single, Double, Triple, and 3½ Decks . . . for Scalping to Final Sizing.

Check your coal preparation costs now! A Seco field man will bring you helpful modernization information or write for Coal Bulletin #11, Dept. CA

**SCREEN EQUIPMENT CO., Inc.**

1730 WALDEN AVENUE, BUFFALO 25, N. Y.

In Canada:

UNITED STEEL CORP., TORONTO, ONTARIO

# NEW STEEL TRACK, CABLE-REEL SHUTTLE CAR

*See it at the Coal Show*

CLEVELAND,
May 14–17

**Low maintenance**—Simplified drive, simplified steering mean less parts to maintain, lower maintenance costs. Construction is rugged and simple. The two driving motors have excess capacity for overloading protection and long, trouble-free operation.

**Simplified operation**—Track-laying offers simple control and steering. Fourteen to sixteen foot turning radius means high maneuverability. Forward and reverse operation are functionally the same.

**Overload capacity**—Capacity may be increased safely 33 to 68 percent through use of sideboards. Designed to take overloads without danger of motor failure or structural damage.

**Easy on roadways**—Low ground pressure—15 pounds per square inch—and special track-block design mean less digging in mine bottom, minimum scuffing on turns. Tracks won't dig holes when operating on alternating hard and soft ground.

**Designed for safety**—All electric equipment is in sealed-type enclosures. Dual seating arrangement permits clear visibility when operating in either direction. General Electric Co., Schenectady 5, N. Y.

## FACTS AND FIGURES—MECHANICAL DATA

| | HEIGHT* 36" | 42" | 54" |
|---|---|---|---|
| **General Design:** | | | |
| Weight (Approx.) Empty | 10 tons | 11 tons | 14 tons |
| Approximate Carrying Capacity Level | 120 cu ft | 190 cu ft | 385 cu ft |
| With 6" side boards | 140 cu ft | 255 cu ft | 460 cu ft |
| With 12" side boards | 160 cu ft | 320 cu ft | 535 cu ft |
| Speed Loaded | 3.0 mph | 3.0 mph | 2.5 mph |
| Turning Radius (Outside) | 14 ft | 14 ft | 16 ft |
| **Principal Dimensions:** | | | |
| Length | 22 ft 8½ in. | 22 ft 8½ in. | 23 ft 0 in. |
| Width | 92 in. | 88 in. | 96 in. |
| Conveyor Width | 42 in. | 52 in. | 60 in. |

*Without side boards

*You can put your confidence in—*

**GENERAL ELECTRIC**

120-58

# TWO CLARKSON

## Offer New Efficiency in Coal Loading

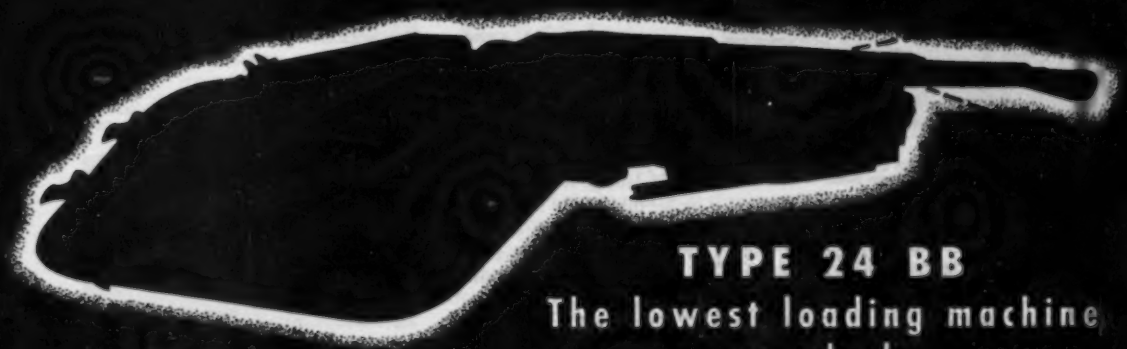
### TYPE 28 FA UNIVERSAL

**The only completely mobile face loader on rubber tires**

Front and rear conveyors flex horizontally and vertically with push-button controls. One 50 HP motor.

Completely flexible. Front head and chassis both swing to permit closer work around face timbers.

Front head raises and lowers 21" above and 18" below floor line. Loader has high road clearance.



### TYPE 24 BB

**The lowest loading machine on wheels**

Conveyor in traveling position well below trolley wires even in very low coal — pan only 23" from rails.

Powerful, compact digger head for tight spots. Hydraulic controls centralized for fast, one-man operation.

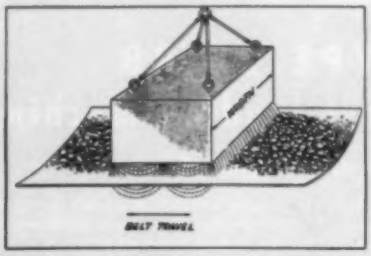
Telescopic jack adjustable to any car height — with oversize cylinders for low hydraulic pressure.

The CLARKSON MANUFACTURING CO.
Nashville
Illinois

LOOK AT THAT AIR GAP — a large midwest coal plant reports extremely effective iron removal from the Dings Deep Burden Rectangular shown.

# POWER that searches down 18" to YANK tramp iron OUT!

SPECTACULAR EVIDENCE OF POWER — a Dings Rectangular easily hoists an auto.




Evenly distributed edge-to-edge flux pattern as diagrammed is big reason for choosing rectangular over circular magnets. For this reason Dings builds other rectangulars which while not as powerful as the Heavy Burden Magnet above are effective at distances up to 12" and have found wide application in the coal industry.

## —DINGS *Heavy Burden* Rectangular Suspended Magnet

HERE'S power that will effectively penetrate through 18" of space and coal — and come up with tramp iron — power that in a factory test jerked a 1500-lb. steel channel through a 22" air gap!

*In short, it's the most powerful tramp iron magnet built.*

This is the magnet to use on your tough jobs — the high belt speeds, the deep burdens — the places where tramp iron damage to machinery means DOWN TIME. Throw in the fact that you're shipping iron free coal and you have the reasons why case records have shown Dings Rectangular Magnets have paid for themselves in less than a year. Dings Magnetic Separator Co., 4720 W. Electric Ave., Milwaukee 46, Wisconsin.

### *Send for Catalog 301-A*

**Catalog 301-A describes Dings Rectangular Suspended Magnets in details you'll want to know about. It's free. Send for it today.**

*World's Largest Exclusive Builders of Magnetic Separators and Tramp Iron Magnets*

# Dings *Magnets*

# GM DIESEL powers world's most compact 600 cfm Compressor

**CONSTRUCTION**—"Starts like a charm, even on the coldest morning. No time wasted in getting up to pressure. Runs a heavy pile driver with ease. We can set it out of the way with a crane and move it back to the roadway for towing in no time."

**QUARRYING AND MINING**—"We couldn't imagine 600 feet coming from such a slick little compressor until we saw the increased drill footage, and the ease with which it took over two FM-2 wagon drills. Good fuel economy, too."

**HIGHWAY BUILDING**—"Plenty of reserve—full capacity at 6,730 feet altitude. We're operating eight 55-lb. blower drills putting in 20-ft. holes on cliffsides. So easy to maneuver and work with that it's a natural for tough jobs like this."

WINNING acclaim as the world's smallest, lightest, big-capacity portable compressor, the new Ingersoll-Rand Gyro-Flow 600 is powered by a 6-cylinder General Motors Series 71 Diesel engine.

This compact, high-powered portable delivers a full 600 cubic feet of air per minute at a steady 100-lb. pressure, yet it weighs only 9,500 pounds. It is 20 to 40% lighter—and as much as 20% smaller—than other portables of comparable capacity.

Being 2-cycle, GM Diesel engines pack more power in less space. They start quickly on their own fuel, run smoothly and enable equipment to maintain rated performance at high altitudes. They're designed for ease of maintenance—no high-pressure fuel tubing—unit injectors that can be changed in a matter of minutes. And, when needed, low-cost "Factory-Engineered" parts are readily obtainable.

These modern 2-cycle Diesels are bringing new economy and efficiency to more than 500 different kinds of power equipment built by 120 manufacturers. Ask your GM Diesel distributor or write us for full details.

ANSWER THE CALL — CIVIL DEFENSE

**DETROIT DIESEL ENGINE DIVISION**

SINGLE ENGINES...Up to 275 H.P. DETROIT 28, MICHIGAN MULTIPLE UNITS...Up to 800 H.P.

GENERAL MOTORS

GM — GENERAL MOTORS — DIESEL POWER

**DIESEL BRAWN WITHOUT THE BULK**

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

*Other Bethlehem Fastenings for the Mine*

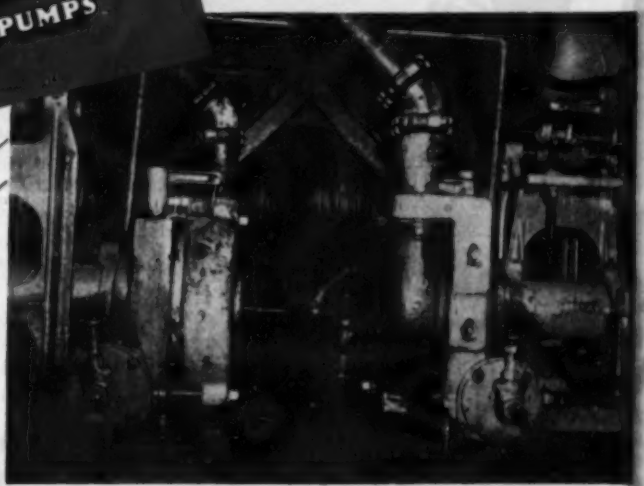
RIVETS • U-BOLTS • THREADED RODS • ROOF BOLTS AND ACCESSORIES • STANDARD BOLTS AND NUTS

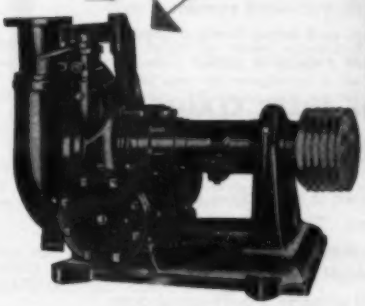
# crushed middling

Companion to the famous WILFLEY Acid Pump

**WILFLEY** centrifugal PUMPS

*Two WILFLEY Pumps in a fine coal preparation plant deliver 4" crushed middling on a continuous, economical basis.*





*Buy* **WILFLEY** *for*
**COST-SAVING** *Performance*

*The new Model K WILFLEY Sand Pump* is engineered to handle crushed middling, heavy media or thickener circuit work on a trouble-free, 'round-the-clock or intermittent schedule. This new WILFLEY embodies many important mechanical improvements which produce worthwhile savings—both power-wise and production-wise. The Model K is built for rugged service... built for efficient operation without media loss or dilution.

There is an economical WILFLEY pump size for every requirement. Wear parts are interchangeable. Individual engineering on every application. Write or wire for Bulletin 200.

**A. R. WILFLEY & SONS**, Inc., Denver, Colorado, U.S.A. • New York Office: 1775 Broadway, New York City

**WE SAY: You will get more lump coal — cleaner coal — at less cost per ton, when you shoot with . . .**

# RED CROWN PERMISSIBLES

**YOU'LL SAY: Man, those are strong words**

**WE SAY: We can PROVE them!**

## 6 ADVANTAGES
### In Every Red Crown Shot

1. Red Crown is easy on the roof.
2. Slow heaving and spreading action with results similar to those obtained with the use of black powder.
3. Power distributed evenly throughout the face of the cut.
4. Coal displaced in firm, hard lumps means less degradation.
5. Red Crown, containing no nitroglycerine, is the non-headache permissible.
6. Less smoke and fumes means less down-time for expensive equipment.

Regardless of the "difference" in your operating conditions—whether you are mining firm or friable coal—Red Crown Permissibles will give you better preparation and performance.

These are patented, Class A Permissibles—unique in the underground mining field. They detonate with a s-l-o-w, heaving action that results in breakage very nearly equal to that obtained with black powder. You'll get cleaner coal, more lump, and bring down a greater tonnage of coal per pound of explosive used.

**WANT PROOF OF THESE CLAIMS?**

Let us demonstrate Red Crown in your mine, under your actual operating conditions. Then you be your own judge of the results. You'll see for yourself how you get more tons per shot, and more lump coal per ton. Just write or phone us and we'll arrange a convenient date. Let us prove that Red Crown can do a better job for you. You'll profit.

KING EXPLOSIVES

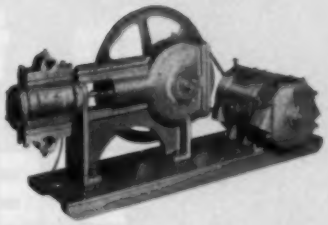
**THE KING POWDER CO. INC.**
CINCINNATI 1, OHIO INCORPORATED 1878

# *Solve* Mine Drainage Problems with FLOOD CITY pumps

## PORTABLE GATHERING PUMP

The Flood City Portable Gathering Pump is a sturdy, compact unit—light enough to be readily moved about the mine. Outstanding features include: Suction and discharge chambers that can be turned to meet existing pipe connections . . . crosshead moves in a cast iron sleeve that is readily removable . . . all moving parts are self-oiling and sealed against leakage and dirt . . . easily replaced valve seat plate, reversible for double life.

SPECIFICATIONS: Capacity, 20 gallons per minute; thoroughly guarded V-belt drive; total weight with 1 H. P. motor, 375#; Length, 42"; Height, 22"; Width, 17" over motor. Dimensions can be adjusted for individual conditions.



## CENTRIFUGAL PUMP

Flood City also manufactures a complete line of Centrifugal Pumps for mines. The working parts are made of high quality acid-resisting bronze with standard ball-bearing pillow blocks that are readily replaceable. Casing rings are of tongue and groove construction that gives a permanent seal at all times. Pumps are designed and built to maintain top operating efficiency with a minimum of maintenance.

SPECIFICATIONS: Complete range of pumps includes capacities of 50 to 1000 gallons per minute. Individual specifications to meet your particular drainage problem will be furnished upon request.

## PLUNGER PUMP

Flood City Plunger Pumps are heavily constructed of acid-resisting material—carefully finished to permit a free flow of water. Reversible water ends are incorporated in the pumps to assure ease of connection. All moving parts are self-lubricated . . . all parts are easily accessible for servicing when required . . . shielded piston rod keeps water off the power frame.

SPECIFICATIONS: 5 x 5 size; Capacity 50 gallons per minute; 2" Suction and 2" discharge. Write for complete information on this and other types of Flood City Pumps.

We also specialize in furnishing BRONZE REPLACEMENT PARTS . . . CAR-SPOTTING HOISTS . . . TROLLEY LINE MATERIAL. Your inquiries are invited.

BE SURE TO VISIT OUR BOOTH NO. 817 AT THE 1951 COAL CONVENTION IN CLEVELAND

# FLOOD CITY BRASS & ELECTRIC CO.

MESSENGER AND ELDER STS., JOHNSTOWN, PA.

BRANCH OFFICE — 4 VIRGINIA ST. • • CHARLESTON, WEST VIRGINIA

# there's plenty in this SLEEVE

The new Fairbanks-Morse Pomona external sleeve bearing assembly gives you *plenty* of advantages in efficient, economical deep-well turbine pump performance.

This important advance in turbine pump bearing design assures maximum life of the bearing assembly without any sacrifice in line shaft streamlining and bowl efficiencies. The full-floating, spiral groove, rubber bearing assures efficient water lubrication. Bearing grooves provide continuous flow from end to end of the bearing . . . a positive flushing action that eliminates any possibility of destructive sand particles traveling across the full face of the bearing.

There is no chance for liquid entry between shaft and sleeve bearing. Friction and shaft bearing losses are reduced to the minimum. Worn sleeves can be easily and inexpensively replaced in the field.

This advanced development, plus the many other Pomona advantages, adds up to maximum efficiency . . . lowest operating and maintenance costs. Your branch pump engineer or Fairbanks-Morse Pomona Pump dealer will be happy to give you the complete story. Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

**FAIRBANKS-MORSE,**

***a name worth remembering***

PUMPS • SCALES • ELECTRIC MOTORS • GENERATORS
LIGHT PLANTS • DIESEL, DUAL FUEL AND GASOLINE ENGINES

"Republic Transmission Belts conserve power. Write today for full facts. There's a Republic Distributor like me close to your plant. Let him make a free analysis of your needs. His recommendations save you money."
"It's thumbs down on overuse of belt dressings which causes lumpy accumulations that result in loss of power and serious belt damage. Republic Transmission Belts have positive gripping surfaces that keep slippage at a minimum."
"To transmit reverse driving power you need strong, flexible belting. We've been using the same Republic Belt for three straight years in our lumber company and are definitely sold on Republic!"

# Try Republic First...

## FOR THE WORLD'S MOST EFFICIENT TRANSMISSION BELTING

You save money and help conserve rubber with pre-tested, pre-stretched Republic Transmission Belting. Whether you use endless or roll lengths in regular or oil-resisting materials, Republic Transmission Belts are built for service and efficiency.

Every belt reflects the experienced designing skill and craftsmanship that built it and your local Republic Distributor can show you how proper application and care result in outstanding performance records.

Remember, for 50 years Republic has been *the* specialist in industrial rubber. Make Republic headquarters for all your industrial rubber requirements.

INDUSTRIAL RUBBER PRODUCTS BY

**REPUBLIC RUBBER DIVISION**

Lee Rubber & Tire Corporation

YOUNGSTOWN, OHIO

# BAKER MINE EQUIPMENT...

## . designed for improving efficiency of trackless underground mining

### BAKER MINE TRACTOR

For trackless hauling of trailers in seams as low as 30 inches. Pneumatic-tired, battery-powered. Pulls ten-ton pay load on pneumatic-tired trailers. Ideal for hauling coal, supplies, mine personnel, face equipment, timbers, etc. Smooth running, easy steering; Economical to operate and maintain. Carries U. S. Bureau of Mines permissible plate.

### BAKER TROLLEY TRACTOR

The ideal supplementary transportation unit for mines utilizing belt conveyors for main line haulage. Operates from trolley or battery—Battery is re-charged while tractor is on trolley thus providing constant operation with no time out. Eliminates charging stations and need for two types of equipment. Safe for hazardous areas when running on battery.

### BAKER TIMBERING MACHINE

Mechanizes erecting of timbers, making it a quick and safe job for a two-man crew. Machine hauls trailer with timbers, saws timbers and positions cross-bars, holding them against roof while posts are measured, sawed and placed. Battery-powered, pneumatic tired, with hydraulically-driven saw. Carries U. S. Bureau of Mines permissible plate.

### DRILLING AND BOLTING HEAD—attachment for Baker Timbering Machine

With this attachment *Roof Bolting* and *Timbering* can be done efficiently with one machine in mines where both types of roof support are used. Full hydraulic power and control provides constant pressure on drill feed and easy positioning with relation to roof or floor. Drill and torque wrench are combined in a single "V" type head.

### BAKER TRIKE—

Maneuverable, 3-wheel, battery-powered, pneumatic-tired unit for carrying mine personnel and hauling trailers loaded to one ton in very low coal. Driven from prone or sitting position. Overall height only 22 inches. Increases efficiency of low-seam mines by bringing key men and materials quickly to the spot where needed. Carries U. S. Bureau of Mines permissible plate.

### BAKER-FLETCHER ROOF DRILL AND WRENCH with hydraulic tram

Highly mobile and compact, self-tramming roof drilling and bolting machine. Operated hydraulically with electric power from drag cable. Hydraulic tilt of 45° either side for angle boring. Drilling speed to 10 FPM. Requires no skill. Fitted for water drilling. Explosion tested.

*Write for complete details*

*Manufactured by*
**THE BAKER-RAULANG CO.**
1213 West 80th Street • • • Cleveland 4, Ohio

*Exclusive Coal Mine Representatives*
**J. H. FLETCHER & CO.**
Chicago, Illinois • • Huntington, W. Virginia

# Baker MINE EQUIPMENT

# See Exhibit of Hendrick's Coal Production Equipment

# BOOTH 830 Coal Convention and Exposition

Working with the coal industry for over seventy years Hendrick has developed a wide line of production-speeding equipment that includes Flanged-Lip Screens, Wedge-Slot Screens, Perforated Metal Plate for Vibrating and Shaking Screens, Elevator Buckets, Flights, Shaker Conveyor Troughs and Ball Frames.

### Hendrick Flanged-Lip Screens

Designed for screening and dewatering coal, Hendrick Flanged-Lip Screens are made with short, medium or long slots in 148 standard slot sizes. The staggered slots, tapered in direction of flow, are practically non-clogging, and the flange at the end of each slot aids in producing faster and cleaner separation.

### Hendrick Wedge-Slot Screens

These continuous slot screens are unequaled for a wide range of screening and dewatering operations. For heavy media, they are used as chute bottoms for dewatering and media recovery; for drum and wheel sections; on vibrators. For jigs and other wash box types, they are used for jig bottoms; and for dewatering and wet screening on shakers, vibrators, and stationary equipment.

For separating cones, with or without sand, they are used for recovery of sand and surplus moisture; for dewatering and wet screening. For chloride washers, they are used for circulating, drain and refuse boards; for drainage, recovery of chloride and screening.

### Hendrick Perforated Plate

Furnished, either flat or corrugated, for vibrating and shaking screens, with any desired shape and size of perforation, in proper gauges of tank, high carbon, high tensile, and abrasion-resisting steels, and in other commercially rolled metals. Uniformity of mesh is retained throughout an unusually long service life; full clearance obviates clogging; ease with which decks can be changed minimizes labor costs.

### Hendrick Elevator Buckets

Made to specifications in any desired size, shape and capacity; plain or perforated; welded or riveted, to handle either wet or dry material.

*Write for detailed information on Hendrick products in which you may be interested.*

SEE OUR CATALOG IN SWEET'S

**HENDRICK**

*Manufacturing Company*

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Milco Open Steel Flooring,
Shur-Site Treads, Armorgrids

41 DUNDAFF STREET, CARBONDALE, PENNA.

*Sales Offices In Principal Cities*

# LIMA

CAPACITIES
CRANES-Up to 110 TONS
SHOVELS-¾ Yds. to 6 Yds.
DRAGLINES-Variable

## LIMA Rubber Mounted TRUCK CRANES in 20 and 35 Tons Capacity

LIMA rubber-mounted cranes offer you the added benefits of greater mobility, less travel time and better maneuverability. Rotating assemblies have the same basic features as corresponding crawler machines, with alterations adapting them to truck or wheel mounting. With outriggers supported, they provide extra capacity; are ideal for operations requiring constant movement around the job, for small scattered jobs, or remotely located.

# FIRST BY COMPARISON

LIMA Shovels, Cranes and Draglines have always stood alone by comparison because they are engineered and built to give every user the best value for his investment. Their high productivity, versatility and money-saving features keep down-time to a minimum and output at a maximum.

Investigate LIMA shovels, cranes and draglines. See for yourself how they help you get greater production at lower cost. *Baldwin-Lima-Hamilton Corporation, Lima-Hamilton Division, Lima, Ohio, U. S. A.*

BALDWIN BLH LIMA-HAMILTON

*SALES AGENTS IN PRINCIPAL CITIES OF THE WORLD*

**BALDWIN-LIMA-HAMILTON**

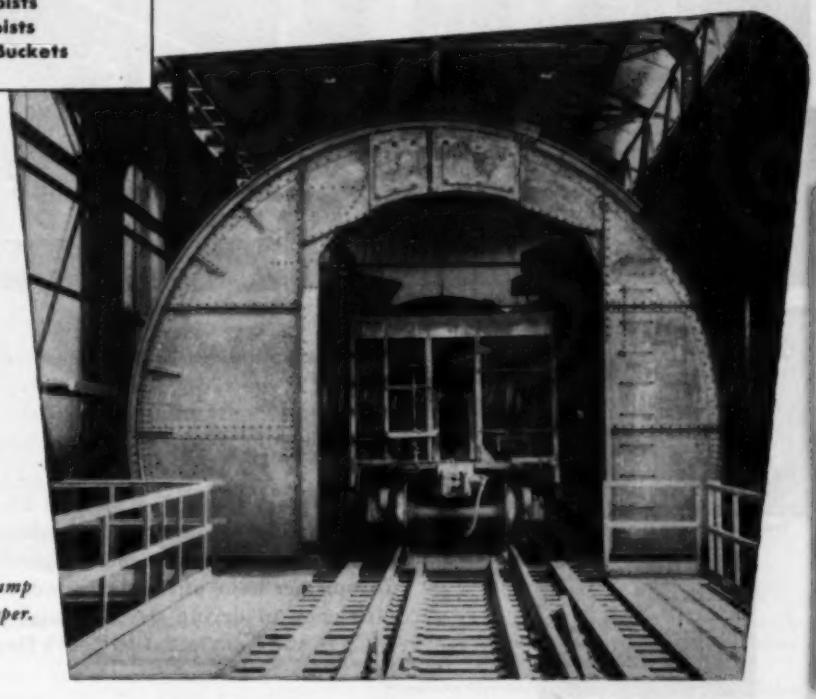
T2101

**Wellman will build it**

- Special Cranes
- Car Dumpers
- Gas Producer Plants
- Ore Bridges
- Charging Machines
- Industrial Furnaces
- Gas Flue Systems
- Gas Reversing Valves
- Coke Pushers
- Mine Hoists
- Skip Hoists
- Clamshell Buckets

# WELLMAN Car Dumpers

***Select the right dumper from the most complete line***

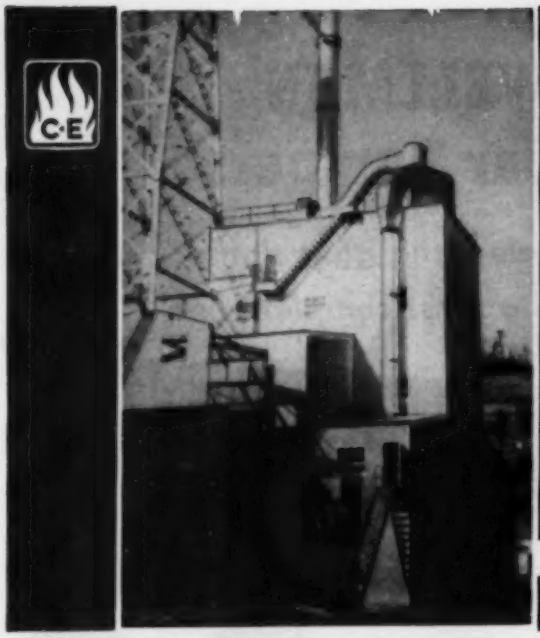


*Wellman 60' 4-clamp Revolving Car Dumper.*

• The complete line of Wellman Car Dumpers includes Lifting, Turnover, Traveling and Revolving Types. The Revolving Type is an example of Wellman's engineering skill. It is self-contained, requiring no external structures. A rack segment and pinion at each end of the frame turns each end equally, preventing distortion of the frame.

**THE WELLMAN ENGINEERING COMPANY**

7007 CENTRAL AVENUE • CLEVELAND 4, OHIO



# Flash Drying

## FINE COAL at BLUE DIAMOND

Tempering Dampers

Air Lock

Control Panel

Wet and Dry Feeder

Bottom Air Tumbler

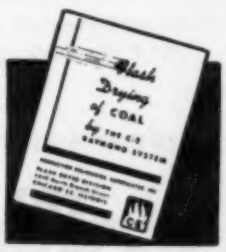
An outstanding example of modern methods of production is the recent C-E Raymond installation at the new Leatherwood mine, one of the properties of the Blue Diamond Coal Co., Toner, Kentucky.

At this plant, the C-E Raymond Flash Drying System is set up with a single drying column, connected with a stoker-fired furnace, and designed for a capacity of 75 tons per hour of finished product. It insures record efficiency in drying the fine coal in a size range of ¼" x 0, and from initial 10% to a final moisture content of 2%.

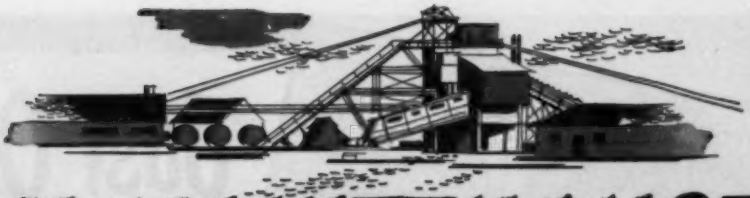
This finely engineered job features unusual operating economy and coal quality . . . with assurance of maximum marketability of the product.

C-E Raymond Flash Drying Systems are available in single column units for handling from 10 to 75 tons per hour, and in multiple columns for still higher capacities.

WRITE FOR COMPLETE CATALOG




**COMBUSTION ENGINEERING-SUPERHEATER, INC.,**
FLASH DRYER DIVISION, 1315 North Branch St., Chicago 22, Ill.



# SLASH MAINTENANCE COSTS!

**Check these advantages!**
**Compare these benefits!**
**See how mechanized handling and application of lubricants can save you**
**WORK, TIME and MONEY**
**in every phase of mining**

**You Get Clean, Fast, Safe Lubrication!** With an Alemite pump in each drum, you can transfer lubricants rapidly, without waste or mess. Refinery-sealed lubricants are kept clean. Alemite loader pumps refill grease guns in seconds. Save time! Save grease! Save work!

**You Cut Repair Costs!** By protecting vital moving parts, you end bearing failures in advance! Alemite pumps have the power and "push" to thoroughly flush-out old, worn-out grease and coal dust from bearing surfaces. Help keep equipment running longer—at less cost!

**You Save Costly Man-Hours!** Faster, easier Alemite methods reduce machine "downtime" for lubrication. Help increase coal tonnage. Above or below ground, Alemite pumps can be powered with air or electricity to suit your individual needs.

**There's An Alemite Pump Just Right For Your Job!** Check today with your local Alemite supplier or write Alemite, Dept. E-51, 1850 Diversey Parkway, Chicago, Ill.

**ALEMITE**

*Lubrication Methods that Cut Maintenance Costs*

Another Product of STEWART WARNER

*Alemite Cuts Costs 3 Ways...*

**1. In Transferring Lubricants** . . . by cutting man-hours 63% for every 100 pounds of lubricant transferred.

**2. In Loading Grease Guns** . . . by saving 3¾ man-hours for every 100 pounds of lubricant loaded into hand guns.

**3. In Applying Lubricants** . . . by saving up to 23.9 man-hours for every 100 pounds of lubricant applied to bearings.

# Just Out!

## NEW 36-PAGE EDITION OF

# PIPING POINTERS

### ...a bigger, more helpful handbook for training maintenance workers

You asked for ¼ million copies of the last edition of Piping Pointers. You found it a big help in training beginners and refreshing veterans in your piping crews. The bigger and better edition is just out—changed in appearance but not in purpose. Crane again offers this booklet—to help keep your piping systems at peak efficiency.

Piping Pointers talks facts . . . not theory. Thoroughly covers the fundamentals of good, sound, everyday piping practices . . . in easy-to-grasp, nontechnical language. Its many "how-to-do-it" features are illustrated for easy understanding.

Mistakes in piping installation and maintenance cost more today. Piping Pointers can help your men avoid them. Just ask your Crane Representative for a copy.

**PARTIAL INDEX TO PIPING POINTERS**

**HOW TO choose valves for every service . . . install valves . . . read reducing fittings . . . make up screwed joints . . . assemble flanged joints . . . make up solder joints . . . install pressure regulators . . . use vent and drain valves . . . avoid steam trap trouble . . . save on pipe joints and materials . . . handle piping tools.**

**plus THE CRANE VALVE SELECTION GUIDE** which saves time and effort in selecting valves for common piping services.

**PIPING POINTERS 16-mm SOUND FILM**
**Free Usage for Group Training**
**A 30-minute motion picture that dramatizes the fundamental information in the Piping Pointers Manual. Ideal for classroom or plant training groups. Available on request through your local Crane Branch.**

# CRANE

CRANE CO., *General Offices:*
836 S. Michigan Ave., Chicago 5, Ill.
*Branches and Wholesalers Serving All Industrial Areas*

**VALVES • FITTINGS • PIPE • PLUMBING • HEATING**

## A Cost-Cutting Undercutter...

IT'S WIRED WITH

# the Cable that Cuts Maintenance Costs

When it comes to designing cost-cutting mining equipment . . . equipment capable of years of trouble-free service...the pace-setting manufacturers of mechanized mining equipment consistently pick Rockbestos A.V.C.*

Little wonder, for this sturdy cable was expressly built to take the toughest mining abuse. Insulated with varnished cambric and impregnated felted asbestos, it can't burn . . . resists moisture . . . stands up under heat.

You'll find it will pay to follow the lead of these top manufacturers. So, always specify Rockbestos A.V.C. when buying new equipment . . . when rewiring older machines.

*Reg. U. S. Pat. Off.

**ROCKBESTOS PRODUCTS CORPORATION**
NEW HAVEN 4, CONN.

NEW YORK CLEVELAND DETROIT CHICAGO
PITTSBURGH ST. LOUIS LOS ANGELES OAKLAND, CAL.

Hi I Your Best Buy!

**ROCKBESTOS A.V.C.**
**has a HIGHER AMPERE RATING**

# How to make Loaders PROFIT PRODUCERS

*Use Mine-Proven*

## WHITNEY CHAINS

### THESE FEATURES SAVE DOLLARS!

1. Easy maintenance and repair with exclusive Whitney "Mine-Chain Assembly" construction.
2. Basic chain is roller type with rigid stud bushings. Riveted construction eliminates cotter pins — assures tight plates.
3. Whitney design eliminates packing of dirt and grit between chain parts. Proper clearances are built into chain for necessary joint freedom.
4. New flight design eliminates localized stresses in flight studs and possibility of loose flights. Ruggedly built of high strength, ductile castings — are designed to act as connecting link between chain sections.
5. Flights are firmly secured by accurate taper fits and are machined to close pitch tolerances.
6. New design of Universal Joints with heavy, flanged sections gives longer life and protects flush headed swivel pin.
7. Large diameter pins are through-hardened for shock resistance.
8. Nuts are self-sealing and locking, assuring corrosion protection to threads and maintenance of original tightness.

Want to keep your loaders up-at-the-face producing instead of in the repair shop? ***Whitney Universal Joint Mine Chain*** will do this for you.

Specifically designed to take the tough, rugged service encountered in mines, this Whitney ***mine-proven*** Chain lowers costs, simplifies maintenance and reduces inventories. It provides ***additional savings*** by enabling you to make ***on-the-job repairs*** down in the mine.

Compare the advantages listed at the left and you'll readily agree that it pays to ***standardize*** on Whitney.

Get in touch with your local Whitney Distributor. He'll gladly supply you with expert advice on your drive problems. Or, write us for Information on this Mine-Engineered Whitney Loader Chain!

### IT'S PACKAGED, TOO!

The chain sections and flight pitches are carefully packaged at the factory for protection. The tough, sealed box keeps out moisture, dirt and dust . . . assures proper prelubrication. All the elements required to assemble Universal Joint Mine Chains are contained in small, easy-to-handle cartons. Cartons conserve storage space — permit shelve stocking — provide accurate inventory control. Clearly labeled with prominently featured part numbers, permits easy, correct selection of chain.

**WHITNEY CHAIN COMPANY**
**210 HAMILTON STREET, HARTFORD 2, CONN.**

**SMOOTHER RUNNING?**

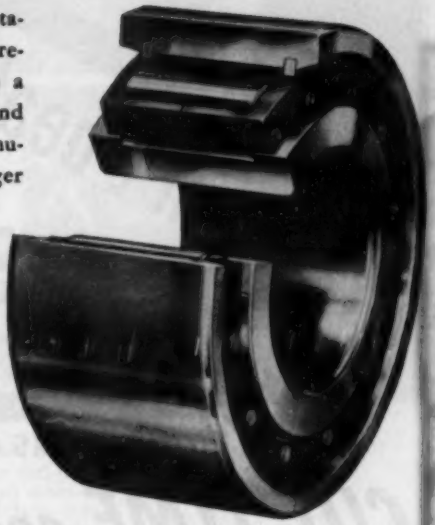
**LOWER MAINTENANCE?**

**LONGER BEARING LIFE?**

# *Yes!*

## . . . because they're MADE RIGHT

Rollway's *right-angle* design promotes true orbital rotation of the rollers around the shaft. And Rollway's precision machining and rigorous inspection produce a bearing with a minimum of end-rub, side-shock and sliding friction of the rollers. Designed right—manufactured right—your Rollway bearings assure you longer wear, less down-time and lower maintenance cost.



**ROLL the RIGHT Way with ROLLWAY**

RIGHT-ANGLE
ROLLER ENDS, precisely square to avoid end-rub, oscillation and side-shock.
RIGHT-ANGLE
BEARING SURFACES with parallelism that results in unswerving rightline rolling.
RIGHT-ANGLE
SEPARATOR SLOTS accurately machined to prevent roller skew, slide and uneven wear.

Let's examine your bearing problems together to determine exactly the kind of bearings you need. Our years of specialized bearing experience, plus complete engineering and metallurgical services, are always at your command. No cost. No obligation. Just write or wire Rollway Bearing Co., Inc., Syracuse, N. Y.

**SALES OFFICES**

Syracuse, Philadelphia, Boston, Pittsburgh, Cleveland, Detroit, Chicago, Houston, Los Angeles

# ROLLWAY BEARINGS

Complete Line of Radial and Thrust Cylindrical Roller Bearings

# You can't beat Specialization!

ENGINEERED TO DO
THE JOB BETTER

CINCINNATI CHAINS AND BITS OUTLAST THEM ALL

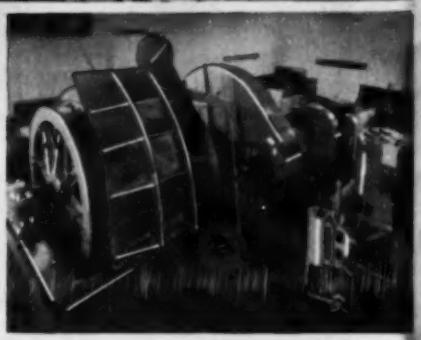
## CUT TIME and COSTS ON YOUR COAL CUTTING OPERATIONS WITH CINCINNATI CHAINS

For over twenty-five years the top men in the Cincinnati Mine Machinery Company have devoted all their efforts, resources, and research to turning out better designed . . . better engineered . . . more efficient cutter chains. And, for 25 years Mine Operators have shown their preference for CINCINNATI CHAINS, both the STANDARD and the DUPLEX. Mine after mine . . . year after year has learned that Cincinnati Chains CUT TIME AND COSTS . . . OUT-CUT AND OUTLAST other chains . . . and of great importance, require a MINIMUM of SERVICING. If you have a particular cutting problem, or are interested in increasing the efficiency of your cutting operations, let us hear from you.

**THE CINCINNATI MINE MACHINERY CO.**

2983 SPRING GROVE AVENUE • CINCINNATI, OHIO

# FROM FACE TO SURFACE ...FAST



## *Two-Speed Man and Material Hoist*

Robert Holmes & Bros., Inc., built this 300 HP two-speed hoist and the head sheaves* for Peabody Coal Company's new Mine No. 17. This modern hoisting equipment, made for dual speed, fast operation and heavy duty service must have bearings that keep friction at the minimum, that are dependable, that are right for long-term service. Naturally, SKF Spherical Roller Bearings were selected for the main drive, drum and sheaves. Time and again SKF has demonstrated ability to supply just the right bearing for the right place—to help designers and builders of all types of equipment develop a better machine, a machine that functions smoothly and economically even under the roughest operating conditions. 7253

*For details on this hoist and other equipment, write Robert Holmes & Bros., Inc., 510-520 Junction Avenue, Danville, Ill.

8 REASONS WHY SKF IS PREFERRED BY ALL INDUSTRY

integrity
craftsmanship
metallurgy
tolerance control
surface finish
product uniformity
engineering service
field service

SKF

SKF INDUSTRIES, INC., Phila. 32, Pa.
*manufacturers of*
SKF *and* HESS-BRIGHT *bearings*

Coal being loaded in cars at a large West Virginia mine *without* Johnson-March treatment. Note excessive dust. Compare this unretouched photo with the picture at the right.

This unretouched photo shows the same operation with a Johnson-March system eliminating dust. These systems have proved themselves in hundreds of mines. We'll be glad to furnish names and addresses.

# STOP COAL DUST

## for ½ cent a ton

## ...70% to 80% more effective than plain water!

A Johnson-March liquid diffusion system will control coal dust wherever it occurs—at the cutting face on mining machines, loaders and continuous miners; at dumps, or at the tipple. It keeps dust from rising and mixing with the air. This eliminates the dust explosion hazard, protects your property, and promotes the health and safety of your employees.

**Tests by the Bureau of Mines have shown that Johnson-March compounds added to water are 70% to 80% more effective in dust control than water alone... and the cost is only ½ cent a ton.**

Without cost or obligation, why not have one of our engineers discuss your dust problems with you? Just drop us a line or mail the attached coupon.

THE JOHNSON-MARCH CORP.
1724 Chestnut St., Philadelphia 3, Pa.
Without cost or obligation, I would like to know more about the Johnson-March system of low-cost dust control. M-1

Name.....
Company.....
Address..... State.....
City.....

**Johnson March**

*Specialists in Liquid Diffusion*

**1724 CHESTNUT STREET** **Philadelphia 3, Pa.**

# Kentucky to West Virginia on a Continental Conveyor

**200 Tons an Hour of Run-of-mine Coal Carried 680 Feet at 200 Feet a Minute**

**Continental Idlers**

A complete line of Troughing, Flat Belt and Picking Table Idlers, Timken or SKF equipped, for belts 14 to 60 inches wide. Also a complete line of accessories, including Trippers, Pulleys, Take-Ups, Drives, etc.

*Write for Bulletin ID-481-A*

When the Belfry Coal Company opened a new mine in Kentucky, they were faced with the problem of hauling the coal across the Tug River to the C & O Railroad in West Virginia. Many methods were considered, but it soon became apparent to company engineers that a belt conveyor carried on a suspension bridge was the most practical solution.

Continental engineers then designed the system pictured above on which run-of-mine coal is uniformly fed by an apron feeder onto the 36" belt conveyor—sped across the river at 200-FPM to the tipple on the opposite embankment.

This is typical of the manner in which Continental engineering is assisting industry in solving their materials handling problems.

***Many industries are taking advantage of our present day stocks to build complete conveyors. Send us your orders or inquiries.***

100A

INDUSTRIAL DIVISION
**CONTINENTAL GIN COMPANY**
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS

# THE PERFECT BALANCE

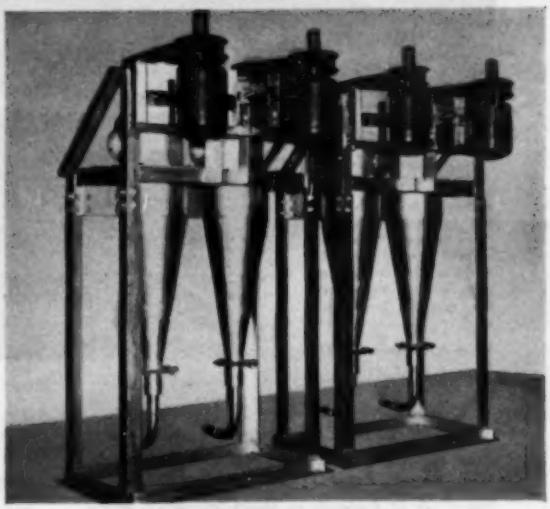
## K. PRINS

*and Associates*

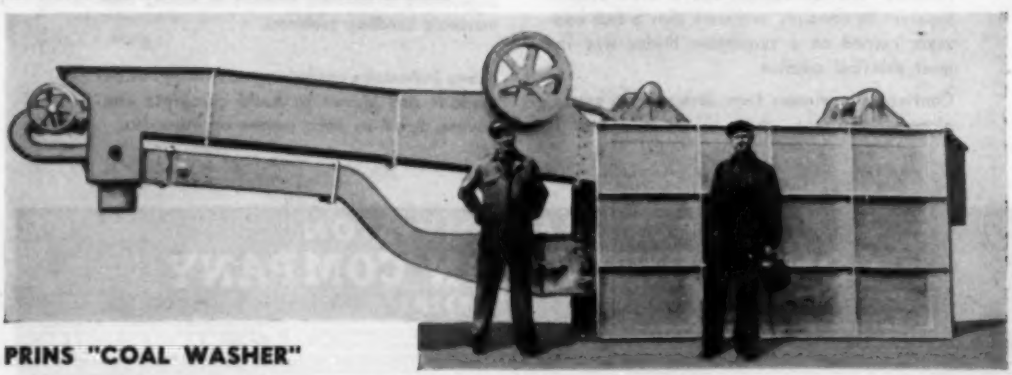
DESIGNERS OF
COAL PROCESSING EQUIPMENT
CONSULTANTS
CONTRACTORS

**WELLSTON,**

**OHIO**



PRINS "STREAMCLEANER"



PRINS "COAL WASHER"

To mine coal, you need the right kind of drill.

this

not this

Same way with trucks.
Get one that fits the job!

# Switch to dependable DODGE "Job-Rated" TRUCKS for more power!

Looking for a way to haul more coal at low cost?

Then switch to trucks that are engineered at the factory to fit the job—dependable Dodge *"Job-Rated"* trucks with more power than ever!

**New Dodge *"Job-Rated"* trucks are the most powerful in Dodge history**—with up to 20% greater horsepower than ever. And you can haul more coal per trip because of scientific weight distribution—plus increased rear axle capacity on many models.

More than that, today's Dodge *"Job-Rated"* trucks give you new ease of handling, easier bad-weather starting and a host of other brand-new advantages!

Find out from your nearby Dodge dealer how a truck that fits your job will save you money.

## "Job-Rated" TRUCKS DO THE MOST FOR YOU

### How a Dodge Truck Is *"Job-Rated"* for Coal Mining

A Dodge *"Job-Rated"* truck is engineered *at the factory* to fit a specific job . . . save you money . . . last longer.

Every unit from engine to rear axle is *"Job-Rated"*—factory-engineered to haul a specific load over the roads you travel and at the speeds you require.

***Every unit that SUPPORTS the load***—frame, axles, springs, wheels, tires, and others—is engineered right to provide the strength and capacity needed.

***Every unit that MOVES the load***—engine, clutch, transmission, propeller shaft, rear axle, and others—is engineered right to meet a particular operating condition.

# ENTERPRISE WHEEL & CAR CORPORATION

## CUSTOM-ENGINEERED MINE CARS . . . . .

ENTERPRISE CARS are built for the mine—*not for the shop*

ENTERPRISE CARS are built to meet *every* mine specification

ENTERPRISE CARS give you *constant haulage* . . . no serious production delays. Repairs will not affect over-all mine operation

ENTERPRISE WHEELS are not made of ordinary cast iron. Enterprise wheels are made of chilled semi-steel—heat-treated for high tensile strength and shock resistance

ENTERPRISE TRUCKS can be furnished with either straight, tapered or ball bearings. In orders and inquiries, please include information regarding style truck, diameter of wheel and axle, track gauge, and wheel base.

*Your insurance against haulage delays and shut-downs . . .*
*. . . MINE CARS*

An experienced mine car engineering and production organization, backed by 52 years' experience, is at your disposal. Write us your haulage requirements and problems.

ENTERPRISE

WHEEL AND CAR CORPORATION
BRISTOL, VIRGINIA - TENNESSEE
HUNTINGTON, WEST VIRGINIA

# YARDLEY M-1 *Flexible* PLASTIC PIPE

**End corrosion troubles for good. Use this tested plastic pipe that is resistant to acids and alkali. It is light, flexible and tough . . . withstands normal operating pressures and temperatures . . . cuts installation costs up to 60% . . . requires minimum maintenance.**

**Yardley M-1 pipe comes ready to use with accessories illustrated. Sleeve-type outside couplings quickly attached with stainless steel clamps. Warehouse stocks near most mining areas.**

Illustration shows a 200-ft. coil of 2" pipe. Approximate weight, 90 lbs.

## Made in 9 sizes...

**Plastic M-1 pipe comes in standard iron pipe sizes: ½, ¾, 1, 1¼, 1½, 2, 3, 4 and 6 inches. Sizes through 3" are coiled; 4" and 6" in straight lengths.**

***Write us for nearest distributor.***

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INSERT ADAPTER

ELBOW

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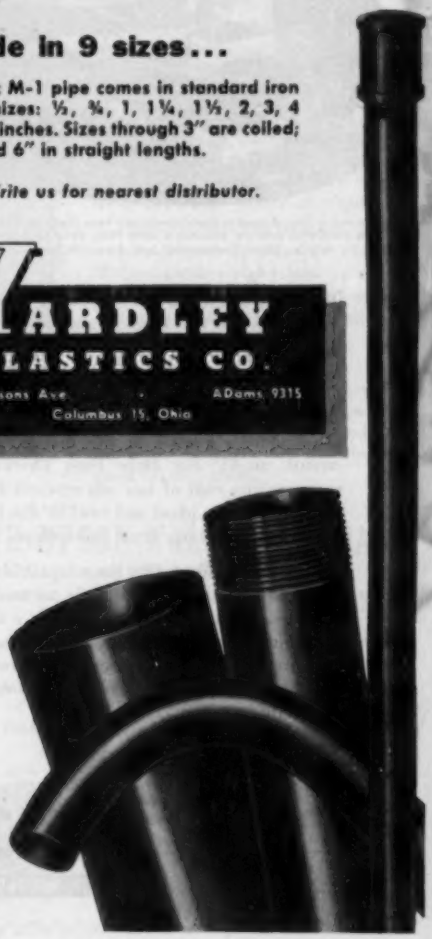

## *Other Yardley Plastic Pipe* ▶ ▶ ▶

**M-4**
**A heavy-duty flexible pipe similar to M-1 for high-pressure, suction and pumping applications.**

**M-3**
**A light-wall, rigid plastic pipe with cement-type fittings and thread adapter.**

**M-3-S**
**Similar to M-3 with heavier wall in standard iron pipe sizes, threaded and coupled. Complete line of plastic fittings.**

# 17 Dorr thickeners...

## at the world's most modern coal preparation plant

*Aerial view of Jones & Laughlin Steel Corporation's Vesta-Shannopin Coal Preparation plant which went into operation in early 1950. Designed by Nelson L. Davis Co., Chicago, Illinois. Photo courtesy Jones & Laughlin Steel Corporation.*

**DORR THICKENERS** . . . seventeen units of three sizes and two types . . . are installed at the Jones & Laughlin Vesta-Shannopin Coal Division's ultra-modern new preparation plant on the Monongahela River near Vestaburg, Pa. Fourteen 10′ dia. Dorr Type A Thickeners are used in the heavy media circuit, an 85′ dia. Dorr Torq Thickener recovers fine coal of low ash content from the heavy media plant and two 150′ dia. Dorr Torqs reclaim water from fine refuse.

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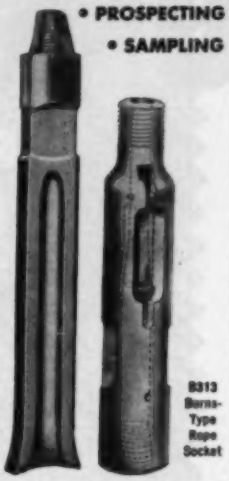

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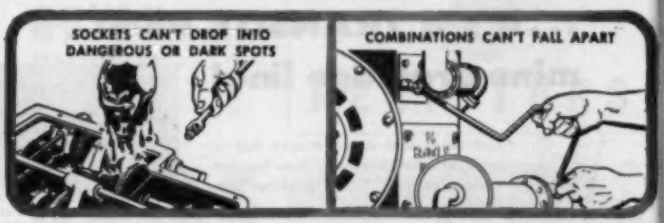


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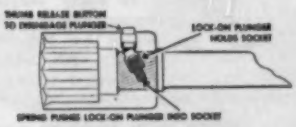


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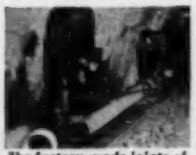

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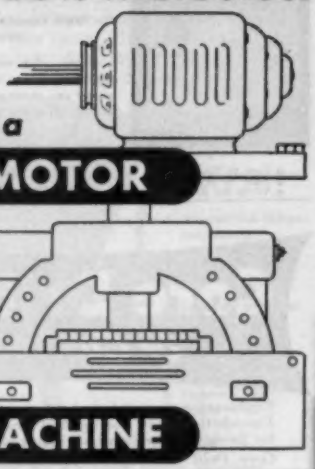


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## If you are MOVING . . .

Don't forget to notify us at least three weeks in advance to insure uninterrupted service to your subscription to COAL AGE.

Please send your change of address together with your old address to:

DIRECTOR of CIRCULATION
COAL AGE, 330 West 42nd Street
New York 18, N. Y.

DON'T FORGET TO NOTIFY YOUR POSTMASTER, TOO!

## FLEXCO® BELT FASTENERS and RIP PLATES

*FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH*

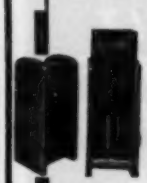
- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute strain uniformly.
- ★ Made of Steel, "Monel," "Everdur." Also "Promal" top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

*Compression Grip distributes strain over whole plate area*

*Order From Your Supply House. Ask for Bulletin F-100*

FLEXIBLE STEEL LACING CO.
4638 Lexington St., Chicago 44, Ill.

## HAMMONDS *SAFE* BLASTING EQUIPMENT



### EXPLOSIVE BOXES

Approved by the Pa. Dep't. of Mines, these rigid non-conductive explosive boxes represent a prime safety investment. Made entirely of wood—tongue-grooved and dovetailed construction . . . no metal parts. . .automatic lock. . .rubber band spring . . . moisture-resistant. Box sizes are based on 1¼" x 8" sticks.

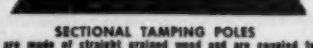
POWDER BOX PRICES ARE AS FOLLOWS:

| | | | |
|---|---|---|---|
| No. 9 | $2.55 ea. | No. 25 | $5.10 ea. |
| No. 12 | 2.95 ea. | No. 36 | 6.50 ea. |
| No. 16 | 3.45 ea. | No. 50 | 7.60 ea. |
| No. 20 | 3.90 ea. | No. 72 | 8.70 ea. |

DETONATOR BOX PRICES ARE AS FOLLOWS:
No. 6, size 2½" x 3" x 6" inside...$2.15 ea.
No. 8, size 2" x 2½" x 8" inside... 2.15 ea.

### WOOD TAMPING POLES

For Tamping Explosive Shots: Poles are round, made of Hardwood. Sizes to 10' long. Price per lineal ft.: 1" dia. 9c; 1⅛" dia. 12c; 1¼" dia. 14c; 1⅜" dia. 18c; 1½" dia. 18c; 1¾" dia. 28c; 2" dia. 32c. Special diameters and lengths can be furnished. These Poles meet the requirements of the New Federal Mine Safety Code.



### SECTIONAL TAMPING POLES

These poles are made of straight grained wood and are coupled together with removable wood pins held in place in recessed grooves by a rubber band and can be quickly connected and disconnected.
Couplers and Head Blocks are 4, 5 and 6 inches in diameter. Please specify size when ordering. Poles are 1½" in diameter.
Head Blocks, $3.70 ea.; Couplers, $2.90 ea.; Poles 12 feet long, $3.80 ea.; Poles 14 feet long, $4.20 ea.; Poles 16 feet long, $4.80 ea.; Poles 18 feet long, $5.30 ea.; Poles 20 feet long, $7.00 ea.; Poles 22 feet long, $8.80 ea.; Poles 24 feet long, $8.60 ea.

**J. V. HAMMOND CO.,** Spangler, Pa.

We also manufacture Shot Firing Units, Wooden Mallet and Wedge Sets, Trolley Poles, Sounding Sticks, Mine Rollers, Insulation Blocks and Brake Blocks

Viking

HOT VAPOR
OIL
TREATMENT
FOR BETTER DUST CONTROL

Write for Details

VIKING MACHINERY SALES CORP.
JACKSON, MICHIGAN

HOFFMAN BROS. DRILLING CO.
Diamond Core Drilling Contractors
Punxsutawney, Pa. · Tel. 382

WE HAVE SPECIALIZED IN TESTING BITUMINOUS COAL LANDS FOR MORE THAN 40 YEARS

GASOLINE • STEAM • ELECTRIC DRILLS • WE PRE-GROUT SHAFT LOCATIONS • HORIZONTAL DRILL HOLES FROM 3" TO 16" FOR DEWATERING MINES • OUR OPERATORS ARE HIGHLY SKILLED

WE HAVE ALWAYS GUARANTEED SATISFACTORY COAL CORES... We solicit your inquiries

"Sutton" SAND DRYING STOVES
The Standard for Over Forty Years
Burns Any Type of Fuel

The "Sutton" Sand Dryer may be fired with any type of fuel. While most "Sutton" Sand Dryers are equipped to burn coal, they can be furnished with burners for natural gas or fuel oil.

"SUTTON" FEATURES

- Simple in operation
- No skilled labor necessary
- Made in four sizes
- Lowest original cost
- Economical upkeep
- Topmost efficiency

SATISFACTION GUARANTEED
Catalog and Prices sent upon request

INDIANA FOUNDRY COMPANY
950 Oak Street Indiana, Pa.

You can Buy No Finer DEEP WELL TURBINE

CAPACITIES TO 5,000 G.P.M.
HEADS TO 400 FT.
OIL LUBRICATED (Bulletin 102-A)
WATER LUBRICATED (Bulletin 102-AA)

For dependable, low cost deep well water supply, install a Deep Well Turbine Pump "by Aurora." It will be a pleasure to send you descriptive data to explain why these distinguished pumps deliver an exceptional degree of satisfaction through EXTRA YEARS.

Write for Details

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA Always PUMPS
AURORA PUMP COMPANY
92 LOUCKS STREET, AURORA, ILLINOIS

Westinghouse
HYDRAULIC BRAKE EQUIPMENT

First step in improving haulage is to improve the brakes. Westinghouse Hydraulic Brake Equipment provides an easy, simple way. Parts, shown above, can be installed in available space when locomotives are in for maintenance. Rugged construction . . . made to stand hard usage. Save brake shoes, wheel turning, replacement of axles and armature shafts, etc. Ask for Bulletin SP 9092 for full details.

Westinghouse Air Brake Co.
Industrial Products Division: Wilmerding, Pa.

*See it at the COAL SHOW*
*NATIONAL MINE SERVICE COMPANY BOOTH 2413*

# SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • **OPPORTUNITIES** • EQUIPMENT—USED or RESALE

**UNDISPLAYED RATE**
$1.20 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line. (See 1 on Box Numbers.)
EMPLOYMENT WANTED and Individual Selling Opportunity undisplayed rate is one-half of above rate, payable in advance.
PROPOSALS, $1.20 cents a line an insertion.

**INFORMATION**
BOX NUMBERS count one additional line in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

**DISPLAYED RATE**
The advertising rate is $9.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. C.A.

*NEW ADVERTISEMENTS received by 10 A.M. May 17 at the New York Office, 330 W. 42nd St., N. Y. 18, N. Y., will appear in the June issue subject to limitations of space available*

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**MOTOR GENERATORS**

2—300 KW G.E. Syn. 275 V. 100 RPM 3 Ph., 60 Cy., 2300/4000 V. AC.
1—200 KW West. Syn. 275 V. 900 RPM 3 Ph., 60 Cy., 2300 V. AC.
1—100 KW G.E. Syn. 275 V. 900 RPM 3 Ph., 60 Cy., 2300 V. AC.
1—100 KW G.E. Ind. 275 V. 1200 RPM 3 Ph., 60 Cy., 2300 V. AC.

**ROTARY CONVERTERS**

1—500 KW G.E. Syn. 275 V. 1200 RPM HCC, 6 Ph., 60 Cy., Transformers
1—300 KW G.E. Syn. 275 V. 1200 RPM HCC, 6 Ph., 60 Cy., Transformers
1—300 KW West. Syn. 275 V. 1200 RPM 6 Ph., 60 Cy. Transformers
1—150 KW G.E. Syn. 275 V. 1200 RPM HCC, 6 Ph., 60 Cy. Transformers
1—150 KW West. Syn. 275 V. 1200 RPM 6 Ph., 60 Cy. Transformers
1—150 KW Ridgway Syn. 275 V. 1200 RPM 6 Ph., 60 Cy. Transformers

**ARMATURES**

1—500 KW G.E. 275 V. MPC Gen. 900 RPM
1—300 KW G.E. 575 V. HCC Conv. 1200 RPM
1—150 KW G.E. 275 V. MPC Gen. 1200 RPM

**LOCOMOTIVES**

2—30 T JEFFREY 250 V. MH-77 48-36" Ga.
1—25 T G.E. 500/250 V. HM-824-A 44-36" Ga.
1—20 T JEFFREY 250 V. MH-77 48-36" Ga.
1—13 T JEFFREY 250 V. MH-2110 4-32" Ga.
1—13 T GOODMAN 250 V. 136-B 36" Ga.
1—10 T JEFFREY 250 V. MH-2110 48-36" Ga.
2—10 T JEFFREY 250 V. MH-110 44-32" Ga.
2—10 T GOODMAN 250 V. 36-B 36" Ga.
2—8 T JEFFREY 250 V. MH-100 42-36" Ga.
1—8 T WEST. 250 V. ML-906-C 44-36" Ga.
2—4 T JEFFREY 250 V. MH-88 44-36" Ga.
1—4 T JEFFREY 250 V. MH-121 44-36" Ga.

**LOCOMOTIVE MOTORS**

2—JEFFREY 250 V. MH-77, Ball Bearing
2—WEST. 250 V. ML-908-C, Ball Bearing
2—WEST. 250 V. ML-906-C, Ball Bearing
3—WEST. 250 V. ML-904-C, B. B.
4—WEST. 250 V. ML-901-C, Ball Bearing
2—G.E. 500/250 V. HM-824-A, Ball Bearing
2—G.E. 85/125 V. HM-828-A, Ball Bearing
4—WEST. 80 V. V-49-X, Ball Bearing

**LOCOMOTIVE ARMATURES**

MH-75-500 V. 908-C-500 V. 158-C-250 V.
MH-77-250 V. 906-C-250 V. HM-824-A-250 V.
MH-110-250 V. 903-C-250 V. HM-824-A-500 V.
MH-100-250 V. 901-C-250 V. HM-809-250 V.
MH-88-250 V. 36-A-250 V.

**WALLACE E. KIRK COMPANY**
501 GRANT BUILDING PITTSBURGH 19, PENNSYLVANIA

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**HOUSING**

We specialize in the sale and purchase of company owned housing

Greve and Whalen
807 Law & Finance Building
Pittsburgh 19, Pennsylvania

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**WANTED**

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**WANTED**

MULTIPLE TRAY
CONTINUOUS CLARIFIER
or
SUBSIDER
or
THICKENER

30 to 36 foot diameter, approximate capacity 100,000 to 140,000 gallons, 4 to 6 tray type. New or used in excellent working conditions. Airmail offers to Mr. O. Ugarte, P.O. Box 1348, Havana, Cuba, stating price, measurements, type, location, delivery date as well as all available data, and enclosing sketch.

---

*REPLIES (Box No.): Address to office nearest you*
*NEW YORK: 330 W. 42nd St. (18)*
*CHICAGO: 520 N. Michigan Ave. (11)*
*SAN FRANCISCO: 68 Post St. (4)*

**POSITIONS WANTED**

GENERAL SUPERINTENDENT or Superintendent 30 years experience. Thorough knowledge land and mechanical mining, construction and general engineering. Married. Age 52. Employed. Desire change. PW 9503 Coal Age.

EMPLOYED MINE manager seeks position, due to depletion as Manager-Superintendent. 46 years of age, 8 years of general construction, 15 years mining and development experience. Thoroughly familiar with work procedures in thin and thick coal, flat and heavy pitch, mechanical or otherwise, all phases of rock work and stripping operations. Excellent production and work relations record. Foreign offers considered. PW 9383 Coal Age.

**WANTED**

ANYTHING within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

---

**Engineers-Executives-Technical Men**

Selected Position, $4,000 to $20,000. This Confidential service for men who desire a new connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details.

TOMSETT ASSOCIATES
1320-2 Berger Bldg. Pittsburgh 19, Pa.

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**COLO. MINE FOR SALE**

Have coal with deactivization to the future synthetic fuels area. Have approx. 60 feet bituminous coal in 3 seams. Mine now operating. Shipping point, Craig, Colo. Brokers invited.

TAYLOR COAL MIN. CO.
Craig, Colo.

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**GRADUATE MINING ENGINEER**

30 to 40 years of age. Must have broad experience in general coal mine engineering, will assume charge of underground surveying, map work and general engineering as assistant to plant engineer. Mine completely mechanized, located at Harewood, W. Va.
Give experience, education, age, references, personal history. Be complete and specific. All inquiries will be handled promptly and confidentially.

SEMET-SOLVAY DIVISION
Allied Chemical & Dye Corporation
Box 670 Bluefield, West Virginia

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**WANTED**

Chief Electrician, age 35-45. Must have at least two years of formal education in electrical engineering and five years of practical experience in a supervisory capacity in modern coal mining operation and preparation plants. This is an excellent opportunity for an assistant chief electrician who desires a promotion. Mines located in Central and Southern Illinois. Reply to:

Material Service Corporation
4226 South Lawndale Avenue
Lyons, Illinois
Attention: Mr. F. W. Loske, Electrical Engineer

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FOR LEASE AT 35¢ PER TON; 174 ACRES LEVEL LAND, PARTLY DRILLED

**OHIO STRIP COAL**

S. W. Jackson Township, Mahoning County, O. 12 to 40 feet overburden with no hard rock. 3½ to 4 feet good coal on hard surface roads. Close to Penna. B.R. Youngstown 15, Warren 10 and Akron 36 miles. Will sign option contract which guarantees worthwhile drilling.
Owner: Donald Kirk, Axis, Ala. Ph. Mobile 3-7980

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*IF there is anything you want . . .*

that other readers of this paper can supply

*or—*

*something you don't want*

that other readers can use, advertise it in the

**SEARCHLIGHT SECTION**

CARLYLE
INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

MANUFACTURERS OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — FUEL, WATER, SUCTION, AIR, STEAM AND WELD HOSE

*WHY WAIT*

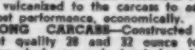
**We have 8 to 48**

**RUBBER CONVEYOR BELTING**

**TOUGH COVERS**—Heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly capable of withstanding the abrasive action of bulk materials. Properly vulcanized to the carcass to assure utmost performance, economically.

**STRONG CARCASS**—Constructed of finest quality 28 and 32 ounce tough cotton duck, properly treated and impregnated to avoid mildew from moisture and atmospheric conditions. Each ply thoroughly embedded in rubber to prevent ply separation.

**FLEXIBILITY** — Careful attention has been given in the construction of all belts to have the proper flexibility assuring the following desirable features: troughs easily, runs true on all idlers, gauge resistant, excellent for long and short haul and slope installations.



***Avoid delays in your production schedules!***

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches.

| Width | Ply | Thickness Top Cover | Thickness Bottom Cover | Type of Duck Carcass |
|---|---|---|---|---|
| 8" | 4 | 1/16" | 1/32" | 28 Oz. |
| 10" | 4 | 1/16" | 1/32" | 28 Oz. |
| 12" | 4 | 1/16" | 1/32" | 28 Oz. |
| 14" | 4 | 1/16" | 1/32" | 28 Oz. |
| 16" | 4 | 1/8" | 1/32" | 28 Oz. |
| 18" | 4 | 1/8" | 1/32" | 28 Oz. |
| 20" | 4 | 1/8" | 1/32" | 28 Oz. |
| 20" | 5 | 1/8" | 1/32" | 28 Oz. |
| 24" | 4 | 1/8" | 1/32" | 28 Oz. |
| 24" | 5 | 1/8" | 1/32" | 28 Oz. |
| 30" | 5 | 1/8" | 1/32" | 28 Oz. |
| 30" | 4 | 1/8" | 1/16" | 32 Oz. |
| 30" | 5 | 1/8" | 1/16" | 32 Oz. |
| 30" | 6 | 1/8" | 1/16" | 32 Oz. |
| 36" | 5 | 1/8" | 1/16" | 32 Oz. |
| 42" | 5 | 1/8" | 1/16" | 32 Oz. |
| 48" | 5 | 1/8" | 1/16" | 32 Oz. |

**INQUIRE FOR SIZES NOT LISTED. ELEVATOR TRANSMISSION & V-BELTING ALSO IN STOCK.**

*All our belting made by the leading belting manufacturers.*

Write for Free Booklet on Installation, Care & Maintenance of Conveyor Belting.

**SEND US YOUR INQUIRIES FOR OTHER RUBBER PRODUCTS**

**CARLYLE RUBBER CO., Inc.**
62 66 Park Place, New York 7, N. Y.
Phone Digby 9 3810

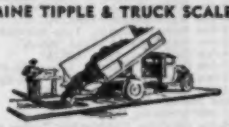


# MODERNIZE WITH BONDED EQUIPMENT

## LOW COST—RUGGED CONSTRUCTION—LONG LIFE

**Guaranteed Equipment — Immediate Shipment From Large Stocks**

**MINE TIPPLE & TRUCK SCALES**



15 ton Truck Scales ..... $545.00
20 Ton Truck Scales ..... 617.00
26 Ton Truck Scales ..... 684.00
Other scales to 50 ton capacity. All truck scales complete with structural steel weighbridge. Replacement parts for most all makes of scales.

Mine Tipple Scales, 5 to 20 tons capacity. Priced from ..... $577.00

**CONVEYORS—PICKING TABLES**

Troughing idler conveyors — picking tables. Any length, belt widths to 60". Prices from ..... $423.00

**TROUGHING IDLERS AND ROLLERS**

All steel, interchangeable with other well-known makes. Replaceable precision ball bearings. No bearing adjustments required. Easy to start and will run in cold weather. Rust-proof ball races; maintenance is negligible.

3-roll Troughing Idlers for these sizes:

| | | | |
|---|---|---|---|
| 14" belt | $22.00 | 24" belt | $25.00 |
| 16" belt | 23.00 | 30" belt | 26.00 |
| 18" belt | 24.00 | 36" belt | 27.00 |
| 42" belt | $28.00 | | |

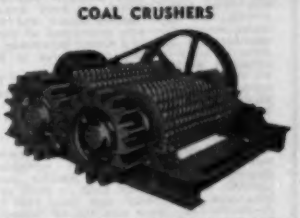
1-roll Return Idlers for these sizes:

| | | | |
|---|---|---|---|
| 24" belt | $10.00 | 36" belt | $11.50 |
| 30" belt | 11.00 | 42" belt | 12.50 |
| 48" belt | $13.50 | | |

**PREFABRICATED CONVEYOR SECTIONS & ACCESSORIES**

Build your own conveyors; we have in stock standard sections, head and tail pulleys, screw takeups, gravity takeups, troughing and picking idlers and return rollers, belting, drives, speed reducers, sheaves, etc. Phone us your order.

**COAL CRUSHERS**



Double and single roll models. Types to produce ½" stoker, and others to crush up to 8" resultant. Capacities from 15 to 800 tons per hour. Steel hoppers included. Priced from ..... $479.00

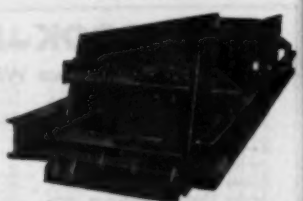
**PAN AND RECIPROCATING FEEDERS**

Complete with motor and drive. 15 to 225 tons per hour capacity. Priced from ..... $423.00

**HEAVY DUTY FLIGHT CONVEYORS**

Any length. Flights up to 6" x 24". All welded structural and sheet steel. Heavy duty, double guided chain. Prices from ..... $571.00

**VIBRATING SCREENS**



Eccentric weight types. Several in stock from 2' x 4' to 3½' x 6'. Priced from ... $479.00
Heavy duty eccentric shaft types. A few on hand, in excellent condition. Sizes from 3' x 8' to 5' x 14'. One to 4 decks. Priced with cloth from ..... $1,575.00

**More than 3000 mines and quarries have modernized with Bonded equipment.**

**Send for circulars, giving full details and price.**

## BONDED SCALE & MACHINE COMPANY

**2190 S. Third Street** — **Columbus 7, Ohio**

**Phones: Garfield 2186; Eves. FR28898**



Used 75 Ton Baldwin Steam Locomotive, Class 8-34-D-550 with tender. Price and information on request.

**DALTON SUPPLY CO.**
2839 Cedar St., Phila. 34, Pa.
GArfield 6-1800



For Sale—4—100 KVA Ustegraff distribution transformers, type HD, oil-immersed, single phase, 60 cycle, 7200/12470Y to 240/480 volts with 2—2½% taps, three in service three years, one new. Available about October 1, 1951. Price $900.00 each, f. o. b. Monsta, W. Va., subject to prior sale.

**Boone County Coal Corporation**
Sharples, West Virginia



FOR SALE

## MACHINE TOOLS

9' LaBlond Heavy Duty Milling Machine.
#5 Cincinnati High Power Milling Machine.
42" Gisholt Vertical Boring Mill.
6' Arm Cincinnati Radial Drill.
32" x 18' Bridgeford G.C.G. Grd. Head Lathe. 9' ctr.
30" x 14' Bridgeford G.C.G. Lathe. 9' ctr.
50 Ton K.R. Wilson #37E Hydraulic Head Forging Press.
2002 Bradley Rubber Helve Hammer.
PARTIAL LISTING—60 Page Catalog Available.

**FALK MACHINERY COMPANY**
18 Ward St., Rochester, N. Y.
BAker 5887



## FOR SALE

50 ton capacity all steel twin hopper cars. Self clearing. 22 available.
80 ton G. E. diesel elec. switching locomotive 500 HP
25 ton Browning 8 wheel steam locomotive crane, new, 1942
3000 CFM Ingersoll Rand electric air compressors, new, 1942

**MISSISSIPPI VALLEY EQUIPMENT CO.**
511 Locust St. — St. Louis 1, Mo.

# NOW SELLING EQUIPMENT FROM FOUR LARGE MINES

**STEEL TIPPLES AND WASHERS**
1—5-Track Steel Tipple, capacity 4000 tons per day, 300 tons per hour, Link-Belt Coal Washer with three Allis-Chalmers low head dewatering screens, four large loading booms and picking tables, various conveyors, motors and all necessary appurtenances. This is a recent installation, complete in every respect, and offered at a very attractive price.
We also have 3-, 4-, 5-, and 6-track steel Tipples complete, suitable for slope, drift, shaft or strip mines.
1—No. C-523 McNally-Norton Coal Washer.

**ELECTRIC HOISTS**
3—Slope Hoists with 700 HP Allis-Chalmers 2300 volt motors, Herringbone gears, hydraulic and dynamic braking, G.E. Liquid rheostat, contactor controls; drum will spool 5000' to 6000' of 1⅛" rope, rope pull 20,000#; rope speed 1200 FPM.
1—Hardie-Tynes Hoist with 700 HP General Electric motor, 2300 volt, hydraulic and dynamic braking, contactor controls, rope speed 1200 FPM, rope pull 25,000#; drum will spool 5000' of 1⅛" rope.
1—Vulcan Double Drum Hoist complete with 800 HP 2300 volt motor and appurtenances, rope speed 1200 FPM, rope pull 35,000#; drums will spool 4000' of 2" rope.
The above Hoists can be seen operating. Also have several 250 HP to 350 HP Hoists suitable for slope, drift, or shaft mines.

**LOCOMOTIVES, 250 VOLT DC, BALLBEARING MOTORS**
2—20-ton Jeffrey, Type MH-77
5—15-ton Jeffrey, Type MH-110
2—10-ton General Electric, Type HM-830
1—10-ton Westinghouse, Type 917-C
5—10-ton Westinghouse, Type 907-C
3— 8-ton General Electric, Type HM-819
4— 8-ton Westinghouse, Type 905-C
4— 8-ton Goodman, Type 32A14T
4— 6-ton General Electric, Type HM-821
2— 6-ton General Electric, Type HM-834
2— 6-ton General Electric, HM-801
3 6-ton Jeffrey, Type MH-88
9— 5-ton Goodman, Type 30-B
3— 4-ton Goodman Combination Trolley and Battery Locomotives, permissible type, and
4— 6-ton Westinghouse Combination Trolley and Battery Locomotives, all with good Exide batteries.
All of the above are late type.

**LOADING MACHINES, 250 VOLT DC**
12—8-BU Joy; 2—11-BU Joy; 9—14-BU Joy
8—L-600 Jeffrey; 3—L-500 Jeffrey; 4—L-400 Jeffrey
4—360 Goodman; 2—460 Goodman
8—Myers-Whaley No. 3 Automat

**LOADING MACHINES, AC**
4—8-BU Joy, 220/440 volt

**CUTTING MACHINES, 250 VOLT DC**
4—29-U Jeffrey
3—29-LE Jeffrey
6—7-AU Joy, almost new
8—35-B Jeffrey
3—35-BB Jeffrey
5—312 Goodman
2—1215 Goodman
14—12-AA Goodman

**SUBSTATION EQUIPMENT**
1—300 KW General Electric Rotary Converter, Type HCC-6, Form P, 600 RPM, 250/275 volt DC, complete with switchboards and switchgear.
1—100 KW General Electric Rotary Converter, Type HCC-6, Form P, 1200 RPM, 275 volt DC, complete with switchboards and switchgear.
1—300 KW General Electric Synchronous Motor Generator Set, Type MPC 6-200-1200, 250/275 volt DC, 3 phase, 60 cycle, 2300 volt AC.
1—200 KW Westinghouse Synchronous Motor Generator Set, Type SX 6-200-1200, 250/275 volt DC, 3 phase, 60 cycle, 2300 volt AC.

**SHUTTLE BUGGIES**
4—Joy Type 42E, cable reel, 250 volt DC. In excellent condition.

**MINE CARS**
502—All Steel Rotary Dump Mine Cars, 3-ton capacity, 16" Timken roller bearing wheels, height 36", track gauge 36". All practically new. A bargain for quick sale.
100—All Steel Watt End Dump Mine Cars, 4-ton capacity, length overall from bumper to bumper 12', inside length 11'3", wheel base 38", height 26", track gauge 42", 14" Timken bearing wheels, 3 link and pin coupling. In perfect condition.
225—All Steel End Dump Mine Cars, 3-ton capacity, inside depth 22", inside width 6', inside length, 9'8½", overall length 12'6", height of car from track 30", 14" Timken bearing wheels, 42" track gauge, practically new.

*We also have a world of other equipment too numerous to mention here, all offered at our usual low prices for quick sale.*

**MEET US AT THE COAL SHOW AT CLEVELAND MAY 14-17.**
**STOP AT OUR BOOTH NO. 2410.**

MAIL US YOUR INQUIRIES FOR HARD TO FIND EQUIPMENT. WE SPECIALIZE IN BUYING OUTRIGHT COMPLETE MINES THAT ARE GOING OUT OF BUSINESS OR FROM RECEIVERS IN BANKRUPTCY, ADMINISTRATORS OF ESTATES, ETC.

## COAL MINE EQUIPMENT SALES COMPANY

FRANK J. WOLFE — SINCE 1912 — SHELDON J. WOLFE
306-307 BEASLEY BUILDING — LONG DISTANCE PHONE 34 — TERRE HAUTE, INDIANA

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# LOOK—BUY—SAVE

***We Own What We Advertise***

1—Joy 8 BU Loader, Late Type
1—Joy 14 BU Loader, Late Type, Med. Pedestal.
3—Joy 12 BU Loaders
1—Joy 7 BU Loader
4—Joy 32-D Shuttle Cars
1—Joy Elevating Conveyor
1—Joy 20" Chain Conveyor—300'
6—Joy 12" Chain Conveyors—300'
1—Hammond 10" Bit Grinder
Mine Rail, Pipe, Copper Cable.
1—Jeffrey Rope & Button Conveyor, 1000' centers.
15—Drop Bottom 44" Ga. Mine Cars.
24—End Dump 48" Ga. Low Vein Mine Cars.
20—End Dump 42" Ga. Low Vein Mine Cars. Loading Booms, 24", 30" and 36". Picking Tables, Shaker Screens, Vibrators. New Ingersoll Rand 105 Cu. Ft. Compressor. Rock Dusters, Mine Fans, Pumps, Compressors.
1—HD-7 AC Angle Dozer
Coal Drills, Stationary Motors AC&DC
Incline Hoists—Wilmot Coal Crusher.
Storage Tank, 12,000 Gal.
2—Dump Trailers, 15 Ton capacity with Mack Tractors.
1—G. E. 801 Locomotive, 42" Ga. with reel, 6 ton, Armor Plate Frame.
1—G. E. 801 Locomotive, 48" Ga. Armor Plate Frame, 29" above rail, 6 ton.
1—G. E. 822 Locomotive, 44" Ga. 8 ton. 2" Armor Plate Frame. 250 V.
42", 44" and 48" Ga. Steel Ties, 25# 40# and 56#.
1—Jeffrey 35-B Shortwall Machine with truck.
4—Goodman Standard 12AA Shortwall Machines.
1—Goodman 112AA Universal Machine. 250 Volts.
100 KW Caterpillar Diesel Plant complete. 250 Volts.

## J. T. FISH & COMPANY

Logan, W. Va. — Phone 2825
*We Buy—Sell—Trade.* — *What Have You?*

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**FOR SALE**
This is practically all new equipment. Due to illness we have been compelled to liquidate.
*1 Phillips push back automatic Dump 36" Ga.*
*1 Barrett, Haentjens & Co. Pump.* 4"—2 stage Volute, Cap.—500 GPM Total Dyn. Head 325, Speed 1750 Motor 75 H.P. (G.E.), All Bronze Pump
*1 CR 1034 manual reduced Voltage Starter*
*1 Hazelton 6" Type in check valve with Mercoid switch.*
*1 Hazelton Mine Type Strainer #605.*
Diagrams, blue prints, etc. on request. This pump is absolutely complete, motor, switch valves, strainers, etc.
*1 Elec. Welder G.E. Model 6WK 1849 G.E.* A.C. Transformer included Welder complete with 91 x 254 std. accessories.
*1 Vulcan hoist.* Print on request; also with hoist one new rotor for motor & one set (2 gears) herringbone gears.
*1 5 ft. steam ventilating fan.*

ZETH COAL COMPANY
HOPEWELL, PENNSYLVANIA
Phone — Hopewell 983

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**FOR SALE**
1 315 Air Compressor on Steel Wheels—Cat D 13000 Motor, Practically new.
1 105 Gasoline Air Compressor.
1 Ingersoll Rand Wagon Drill, slightly used.
1 Bantam Rock Duster on Rubber Tires, Practically new.
1 200 kw Generator Set, 250 Volts.
1 Mine Fan.
1 Scraper Conveyor & Picking Table, Never used.

LUXNER COAL COMPANY
Carmichaels, Pennsylvania
Phone 3751

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*NEW and REBUILT STORAGE BATTERY*

## LOCOMOTIVES

3½ to 10 Tons 13" to 54" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg, Pa.

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**INTERNATIONAL TD 18**
with hydraulic angledozer, double drum cable control PCU and rooter. In excellent condition. Suitable for stripping. Guaranteed. $6500.00.

OVERTON C. EVANS
Mt. Sterling, Ky.

# MOTORS — M. G. SETS — TRANSFORMERS

**SQUIRREL CAGE MOTORS**
3-Ph., 60-Cy.

| Qu. | H.P. | Make | Type | Volts | RPM |
|---|---|---|---|---|---|
| 1 | 400 | G.E. | TC | 2300 | 514 |
| 1 | 400 | G.E. | KT-412 | 2300 | 450 |
| 1 | 250 | Wbse. | CS | 2300 | 1180 |
| 1 | 250 | AL. Ch. | AR | 220/440 | 885 |
| 1 | 125 | AL. Ch. | AR | 2300 | 1750 |
| 1 | 125 | Wbse. | CS-701 | 440 | 1750 |
| 1 | 125 | G.E. | KT-583 | 2300 | 875 |
| 1 | 100 | G.E. | 1SBQ | 440 | 450 |
| 1 | 100 | Wbse. | CS-582 | 440 | 1750 |
| 1 | 100 | AL. Ch. | AR-300 | 2300 | 1180 |
| 1 | 100 | AL. Ch. | AR | 440 | 885 |
| 1 | 100 | F.M. | H-501B | 440 | 885 |
| 1 | 100 | Wbse. | CS-580 | 2300 | 514 |

**SYNCHRONOUS MOTORS**
3-Phase, 60-Cycle

| Qu. | H.P. | Make | P.F. | Volts | R.P.M. |
|---|---|---|---|---|---|
| 1 | 1500 | Wbse. | .8 | 2300 | 720 |
| 1 | 750 | G.E. | .8 | 2300 | 720 |
| 1 | 450 | Wbse. | .8 | 440 | 900 |
| 1 | 300 | AL. Ch. | 1. | 2300 | 900 |
| 1 | 150 | G.E. | 1. | 2300 | 900 |
| 1 | 150 | G.E. | .8 | 550 | 450 |
| 1 | 150 | G.E. | .8 | 2300 | 900 |
| 2 | 125 | AL. Ch. | 1. | 2300/3600 | 900 |
| 1 | 125 | AL. Ch. | .8 | 2300 | 1800 |
| 3 | 100 | Wbse. | .8 | 440 | 1200 |
| 1 | 100 | Wbse. | 1. | 2300 | 1200 |
| 1 | 100 | Ideal | .8 | 440 | 900 |
| 1 | 100 | G.E. | .8 | 440 | 900 |
| 1 | 60 | G.E. | .8 | 440 | 1200 |
| 1 | 60 | G.E. | .8 | 2300 | 600 |

With the above we can supply manual, semi-magnetic or full magnetic, reduced or full voltage control.

**SLIP RING MOTORS—CONSTANT DUTY**
3-Phase, 60-Cycle

| QU. | H.P. | Make | TYPE | VOLTS | R.P.M. |
|---|---|---|---|---|---|
| 1 | 2500 | G.E. | MT | 2300 | 257 |
| 1*** | 1000 | AL.CH. | ANT | 2300 | 225 |
| 2 | 500 | G.E. | 1-16-M | 2300 | 450 |
| 1 | 500 | WHSE. | CW | 2300 | 514 |
| 1 | 500 | AL.CH. | ART | 2300 | 894 |
| 1*** | 400 | G.E. | MT-574 | 550 | 885 |
| 1** | 400 | G.E. | 1-M | 2300 | 900 |
| 1** | 400 | AL.CH. | ANT | 2300 | 885 |
| 2 | 400 | G.E. | MT-413 | 2300 | 440 |
| 1 | 300 | G.E. | 1-813-M | 2300 | 1200 |
| 1 | 300 | AL.CH. | ART | 2300 | 885 |
| 1 | 300 | G.E. | MT-414 | 2300 | 600 |
| 1 | 250 | G.E. | I.M. | 2300 | 885 |
| 1 | 150 | G.E. | 1-813-M | 2300 | 1750 |
| 1 | 150 | WHSE. | CW | 2300 | 885 |
| 1*** | 150 | WHSE. | CW-870 | 2300 | 885 |
| 1 | 100 | F.M. | 450-C | 440 | 885 |
| 1 | 75 | G.E. | I.M. | 440 | 885 |
| 1 | 60 | G.E. | MT-538 | 2300 | 1150 |
| 1 | 50 | AL.CH. | ART | 440 | 885 |
| 1 | 50 | AL.CH. | ART | 2300/440 | 514 |
| 1 | 40 | F.M. | SLR | 440 | 885 |
| 1 | 40 | AL.CH. | ART | 2300/440 | 450 |

*—Mill type pedestal bearing. ***—2-bearing.

**TRANSFORMERS (OIL COOLED)**

| QU. | K.V.A. | MAKE | TYPE | PHASE | VOLTAGE |
|---|---|---|---|---|---|
| 1 | 7500 | G.E. | H | 3 | 22000/2300 |
| | | | | | 13800/2300 |
| 2 | 6375 | G.E. | H.T. | 3 | 27600/13800 |
| | | | | | 2300 |
| 1 | 3750 | WHSE. | S | 3 | 67000/14400 |
| | | | | | 2400 |
| 1 | 500 | G.E. | H | 1 | 13200/11000 |
| | | | | | 220/440 |
| 2 | 150 | G.E. | H | 1 | 19000/2500 |
| | | | | | 550/2200 |
| 3 | 100 | WHSE. | AUTO | 1 | 2300 /4100 |
| | | | | | 1265/2400 |
| 3 | 100 | WHSE. | S.S. | 1 | 13975/10055 |
| | | | | | 220/440 |
| 2 | 50 | WAGNER | H.H. | 1 | 13200/11500 |
| | | | | | 575/265 |
| 2 | 50 | AL.CH. | OISC | 1 | 22000 — 230 |

**MOTOR GENERATOR SETS**

| QU. | KW | | MAKE | RPM | VOLTS DC | VOLTS AC |
|---|---|---|---|---|---|---|
| 1 | 750 | | Wbse. | 900 | 600 | 2300 |
| 1 | 700 | (2-U) | G.E. | 720 | 600 | 2300/440 |
| 1 | 600 | (3-U) | Wbse. | 1200 | 120/240 | 4000/2300 |
| 1 | 600 | (3-U) | Ideal | 1200 | 120/240 | 4000/2300 |
| 1 | 500 | | C.W. | 720 | 575 | 2300/440 |
| 1 | 500 | | C.W. | 720 | 250/275 | 2300/440 |
| 1 | 300 | | Ridgway | 900 | 575 | 2300 |
| 1 | 150 | | G.E. | 720 | 250 | 2300/440 |
| 1 | 150 | | Al.Ch. | 1200 | 250 | 2300/440 |
| 1 | 100 | | Ridgway | 1200 | 250 | 2300/440 |
| 1 | 75 | | Star | 1200 | 250 | 440/250 |
| 1 | 75 | | Al.Ch. | 900 | 250 | 2300 |
| 2 | 60 | | Sturtz | 1200 | 240 | 440/220 |
| 1 | 45 | | Wbse. | 1200 | 125 | 440/250 |
| 1 | 30 | | Reliance | 1800 | 250 | 440/250 |
| 1 | 25 | | Wbse. | 1200 | 120/240 | 440/250 |
| 1 | 20 | | Reliance | 1800 | 250 | 440/250 |

3-U—3-unit set

We can also furnish any of the above with exciters and VARIABLE VOLTAGE CONTROL engineered and rebuilt to suit your requirements.

**DIRECT CURRENT MOTORS**

| QU. | H. P. | MAKE | TYPE | RPM |
|---|---|---|---|---|
| 1 | 200 | G.E. | CD 160 | 1150 |
| 1 | 125 | Wbse. | QAC | 450/900 |
| 1 | 200/250 | G.E. | No. 23 | 600/1200 |
| 1 | 200 | Wbse. | Mill (Rev) | 300/1200 |
| 1 | 150 | G.E. | MPC | 900 |
| 1 | 150 | Al.Ch. | Mill (Rev) | 400/1200 |
| 1* | 125 | Cr.Wh. | KSH | 600 |
| 1*** | 125 | Wbse. | 810-100 | 600 |
| 1 | 100/125 | Ral. | 1005P | 300/1200 |
| 2 | 100 | Ral. | 1005P | 450/1200 |
| 1 | 60/100 | G.E. | MPL | 675/1125 |
| 1* | 50/75 | Ral. | 1005P | 300/1200 |
| 1 | 50 | G.E. | RP14 | 300/900 |
| 1* | 50/75 | Wbse. | SK1181L | 600/1200 |
| 1 | 40 | Al.Ch. | 8137 | 850/1750 |
| 1 | 35 | G.E. | CD122 | 600/1200 |
| 1 | 35 | G.E. | CD147 | 900/1500 |
| 2 | 35 | G.E. | RP14 | 600/1200 |
| 1 | 30 | Ral. | ? | 250/1000 |
| 1 | 22½ | Wbse. | SK180 | 600/1200 |
| 2 | 25 | Al.Ch. | 8145 | 600/1200 |
| 1 | 25 | G.E. | CDM106 | 875/1750 |
| 2 | 27½ | Bl.Dy. | 160 | 600/1200 |
| 1 | 20 | G.E. | RP15 | 600/1000 |
| 1 | 20 | G.E. | CD120 | 600/1200 |
| 1 | 20 | G.E. | RP15 | 600/1200 |
| 1 | 20 | Wbse. | SK1111L | 250/1000 |
| 1 | 20 | Al.Ch. | 8130 | 600/1200 |
| 1 | 20 | Wbse. | SK120 | 875/1500 |
| 3 | 20 | G.E. | CD122 | 600/1200 |

Above are all 230 VDC except where marked***

## T. B. MAC CABE COMPANY

4316 CLARISSA STREET — Phone DAvenport 4-8300 — PHILADELPHIA 40, PENNA.

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4—14BU-3PME Joy Loaders, Low Pedestal, 250 Volt DC. *GOOD CONDITION — BARGAIN.*

1—8BU Joy Loader "REBUILT", Low Pedestal, 250 Volt DC. *IN STOCK.*

1—1500′ Jeffrey 30″ belt conveyor, Type 52B, 25 HP DC Motor. Complete with belt and rollers. *EXCELLENT CONDITION.*

1—200 HP Slope Hoist. Complete with motor and control. BARGAIN.

**Tippins Machinery Co.**
1001 Washington Blvd.
Pittsburgh 6, Penna.

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# REBUILT ELECTRICAL MACHINERY

**MOTOR GENERATOR SETS**

1500 KW G.E. 275 v. 514R—Syn.
1250 KW G.E. 275 v. 720R—Syn.
750 KW Allis 250 v. 514R—Syn.
400 KW West. 550 v.—720R—Syn.
300 KW Ridg. 275 v. 1200R—Syn.
200 KW West. 550 v. 1200R—Syn.
200 KW West. 275 v. 1200R—SK—CW
200 KW Ridg. 275 v. 900R—Syn.
200 KW G.E. 550 v. 1200R—MPC—ATI
200 KW G.E. 275 v. 1200R—MPC—ATI
150 KW West. 275 v. 1200R—Syn.
150 KW G.E. 550 v. 900R—DLC—ATI
100 KW Ridg. 275 v. 1200R—ATI

**ROTARY CONVERTERS**

150 KW West. Rotary, 275 v.—1200R
300 KW G.E. Rotary, 275 v. HCC6—1200R
300 KW West. Rotary, 275 v.—1200R
350 KW G.E. Rotary, 275 v. HC12—600R
500 KW G.E. Rotary, 275 v. 1200R

**DC GENERATORS**

150 KW G.E. RC 550 v. 1200 RPM
150 KW Triumph 250 v. 600 RPM

**AC MOTORS**

| HP | MAKE | SPEED | TYPE | WDG. |
|---|---|---|---|---|
| 1200 | G.E. | 277 | MT | S.R. |
| 600 | G.E. | 600 | MT | S.R. |
| 400 | G.E. | 450 | MT | S.R. |
| 300 | G.E. | 450 | IM | S.R. |
| 160 | G.E. | 600 | IK | S.C. |
| 150 | West. | 900 | CS | S.C. |
| 150 | G.E. | 600 | ATI | Syn. |
| 2—100 | G.E. | 450 | IM | S.R. |
| 100 | Al.-Ch. | 720 | ARX | S.C. |
| 100 | West. | 1200 | CS | S.C. |
| 75 | G.E. | 600 | ITC | S.R. |

**LOCOMOTIVES AND CUTTING MACHINES**

10 Ton Jeff 250 v. 36/42″ MH110
8 Ton Goodman 250 v. 44/42″ Ga. 9104C2
8 Ton Goodman 500 v. 44/42″ Ga. 9104C2
2—8 Ton Jeff. 250 v. 42″ MH100
6 Ton Westgh. 250 v. 36″ Ga. 904
6 Ton G.E. Battery 42/44″ Ga.
5½ Ton Ironton Battery 42/44″ Ga.
4—5 Ton Goodman 30B 250 v. 42/44″
35 B Jeff. 250 v. Permissible
12 G3 Goodman Shortwall 220/3/60

**MOORHEAD ELECTRICAL MACHINERY CO.**
363 Noblestown Road, Oakdale, Pa. — Pittsburgh District — WAlnut 1-4300

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# CONVEYORS

**Belt, Bucket, Drag or Gravity**
**Shaker & Vibrating Screens**
**Truck Scales — Coal Crushers**
**Coal Drills — Car Spotters**
**Mine Fans — Electric Motors**
**Hoists — Mining and Stripping Equipment**

*WHAT DO YOU NEED?*

THE INDUSTRIAL EQUIPMENT CORP.
910 First National Bank Bldg., ATlantic 1-3929
Pittsburgh 22, Pa.

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# Westinghouse New Mercury Arc Rectifier

NEW MERCURY ARC RECTIFIER—Never operated in service: U. S. Govt., installed but never operated except for Test when sold. Can be operated when inspected. Built by Westinghouse. Rating 500 KW., continuous 624 2 hrs.

A Complete Westinghouse Unit With All Accessories: Ignitron Tubes, Transformers, Switchgears in cubicles. Drawings, Complete Data furnished on request.

**CHARLES WEAVER, *Owner***
4145 Penobscot Building, Detroit 26, Michigan
Telephone: Woodward 1-1340-1

### BATTERY LOCOMOTIVES

2—Ironton Locos. 6000# Chassis, 36" ga. complete with Exide Batteries and Chargers.

### COAL CRUSHERS

1—24 x 24 Jeffrey Single Roll, with or without motor

1—36" American Ring Type Crusher

### PIT CARS

150—Card RB Pit Cars, 36" gal., 1.7 ton cap.
16—Card RB Pit Cars, 36" ga., 1 ton cap.

### HOISTS

1—3 Drum I.R. Slusher, with built-in 50 HP AC Motor

1—#21½ Vulcan Single Drum, direct geared to a U-6 International Gas Power Unit

1—#6½ Vulcan, single drum

1—Box Iron Wks. Single Drum, direct geared to a 15 HP Slip-ring Motor

1—H&B Single Drum Converted, direct geared to a 25 HP Slip-ring Motor

1—Crow Converted Single Drum Friction, direct geared to a 7½ HP Slip-ring Motor

1—80 HP Angel I. Wks. Double Drum Hoist, 8000# rope pull, complete with motor & limit switches

### MISCELLANEOUS

1—20 HP Upright Boiler

1—12" x 30" Suspension Type Jeffrey Vib. Feeder

25—Tons 85# Rail

10—Tons 65# Rail

1—G-20 Goodman Shaker Conveyor, with pans & duckbill

1—3200' Aerial Tramway

1—Metal Mine Phone

Approx. 1000'—2-cond. Tyrex Power Cable

Copper Wire

Belt Conveyors made up to your specifications

Motors—¼ HP to 50 HP

*WRITE FOR STOCK BULLETIN*

## FLORENCE MACHINERY AND SUPPLY CO.

**Suite 904, Equitable Bldg. C. J. Parrish, Mgr. Denver 2, Colo.**

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### MINE AND SLOPE HOISTS

1—20,000# Allis-Chalmers, Dbl Drum
1—20,000# Northern Sgl Drum
1—20,000# Vulcan Sgl Drum AC with MG Set Complete
1—11,000# Wellman, Sgl Drum AC
1—10,000# Allis-Chalmers Sgl Drum
1— 7,500# Ottumwa Sgl Drum AC

### CARPULLERS AND LOADERS

1—20000# Jeffrey Carspotter AC
1—20000# Brownie Carspotter AC
1—20000# Link-Belt Carspotter AC
1—20,000# Amer. Hoist Carspotter AC
1—20,000# LB Endless Puller

### CRUSHERS & MISC.

1—30x36 Jeffrey Sgl Roll
1—32x16 Eagle Dbl Roll
1—16x20 Eagle Dbl Roll
1—320 ft. x 20" SA Comb. Scraper & Bucket Conveyor w/o Mtr. Used for tipple or dock.
2—24"x80' SA portb. conveyors, AC mtr.
1—(New) NOLAN Portb. feeder
1—22"x80" - SD-RS Roots Connersville Positive Pres. Blower output 45 CF per. Rev. Complete with 100 hp. AC Mtr and controls.
1—2 yd. Saurman Scraper Bucket System
1—75' x 25' x 20' High Steel Building

**134 So. Michigan Ave., Chicago 3, Ill.**

## HAWKINS & CO.

**TELEPHONE HARRISON 7-0725**

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## For Sale

**Bucyrus-Erie Shovel 44B**
**Serial #22084**
**Powered by Buda Diesel Engine**
**Complete with Shovel Front**
**65' Crane Boom and**
**2 yd Owen Clamshell Bucket**

**Glazer Steel Corporation**

**2100 Adair Ave. Phone 4-8601**
**Knoxville, Tennessee**

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### ROTARY CONVERTERS

**Attractive Price — Immediate Shipment**

1—200 Kw General Electric

1—200 Kw Westinghouse

1—200 Kw Allis-Chalmers, 275 Volts DC, 1200 rpm., compound wound, 6 phase, 60 cycle; with AC & DC Switchboards; with and without transformers.

Other sizes 100 to 1000 Kw.

## R. H. BENNEY EQUIPMENT CO.

5024 Montgomery Road, Norwood 12, Ohio
Cincinnati Phone: MElrose 1108

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### FOR SALE

1—512 Goodman Cutting Machine — A-1 Condition.

1—F-45 Syntron Vibrating Conveyor—New.

1—30" x 132' Barber Greene permanent Conveyor—New.

1—6T Atlas Battery Locomotive—A-1 Condition.

2—#572 D.C. Chicago Pneumatic Permissible Coal Drills—New.

## UNION COAL COMPANY

**Main Street, Route 18 Burgettstown, Pa.**

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### FOR SALE

495 New Star Electric Co.
BALL BEARING
230 Volts, D. C. Motors
14-½ H.P.
Type SO-1520
1250 RPM
Continuous Duty
F.L. 52 AMPS
Compound Wound
AMB — 40°
Typical Serial #48 49-354

## Eastern Scrap & Salvage Corporation

**65 Muirheid Avenue**
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**Telephone 5-6349**

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*Communication Problems Solved!*

## ARMY FIELD TELEPHONES & WIRE

Mining men, construction men, engineers, farmers, and industrial men everywhere are using portable Army Field Telephones for quick, dependable 2-way to 8-way communication. These phones were built to serve combat forces reliably under battlefield conditions. Simple to install. Just string this 2-conductor wire, attach phones, ring and talk any distance up to 17 miles! Powered by flashlight batteries. No maintenance required.

### EE8 FIELD TELEPHONES

Factory reconditioned, LIKE-NEW. Ea. $16.50. Per pr. $32.50

Reconditioned, factory-tested. Ea. $15.00. Per pr. $29.50

**GUARANTEED**

**Write for FREE FOLDER.**

### *TELEPHONE WIRE*

**All-purpose — All-weather**

This is genuine W110B Army Field Wire on original steel reels. Insulated, 2-conductor, copper-steel strands. Excellent for all types of communication. Used extensively by telephone companies, industry, engineering projects, ranches, public address systems, etc.

GRADE I—New, unused, excellent condition.

Mile reels (wt. 160 lbs.) .... $19.50
Half-mile reels (wt. 80 lbs.) .. 10.00

GRADE II—New, unused, good condition.

Mile reels ..... $15.50
Half-mile reels ..... 8.00

**ACT NOW! LIMITED SUPPLY!**

All prices FOB Sacramento. No COD (Calif. residents add 3% for sales tax.)

SEND CHECK OR MONEY ORDER **LORIS SALES**

P.O. Box 1996-Y5, Sacramento, California.

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**HOIST MOTORS:** 2 — 100 HP Allis Chalmers, 3/60/440/580 RPM, Type ARYM, R.B.
**SYNCHRONOUS MOTOR:** 60 HP G.E., ATI 3/60/220/440/1200 DI. Con. Ex.
**GEAR REDUCERS:** 2 — 15 Falk, Size 8SRZ, No. 38358, Ratios 50/1.

**Illinois Electric Works, Inc.**

1304-08 Missouri Ave. East St. Louis, Ill.

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**FOR SALE:** 1—1263 Goodman A. C. 220 V. Shortwall cutting machine with 6½ ft. bar, 84" gauge truck with reel and approved rubber cable.
1—Hoist, double drum about 42" diam., 350 ft. ⅞" cable. The drum will hold about 1,000 ft. rope each.

**R. W. Kerry & Sons**

**R.D. #1, Harmony, Pa.**

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MOTORS, GENERATORS, TRANSFORMERS
1 — 1500 H.P.
Bought and Sold
New and Rebuilt
ELECTRIC EQUIPMENT CO
ROCHESTER 1, N. Y.

# FOR SALE

### CRUSHERS

1—24x48 McNally Pittsburgh double roll crusher.
1—30x60 Link Belt double roller crusher.
1—18x16 Jeffrey single roll crusher.
1—30x36 United Iron Works single roll crusher.
1—24x24 Jeffrey single roll crusher.
1—24x24 Harnisch single roll crusher.

### HOISTS

1—Ottumwa Iron Works conical drum hoist, serial #2153, weight 25,000#, 1¼" rope complete with remote control and hydraulic brake. Direct connected to GE 300 HP motor, model #C2047, type HTO-5017, form M 2/60/2200V, 570 RPM, 73% amps. 879 secondary amps, complete with automatic switchboard.

1—Ottumwa Iron Works, single rigid cylindro-conical drum hoist, serial #4080, weight 43,000 lbs. 1⅛" rope complete with remote control and hydraulic brakes direct connected to Western Electric 150 HP. motor, model 17615, type MT-364-16-150-720, form B, 3 phase, 60 cycle, 550 volts, slip ring, secondary volts 595, amps. 187, secondary amps. 193, speed full load 700, serial #4563812 continuous 40° C. Complete controller and resistance.

1—Ottumwa Hoist #3561, drum diameter 48", face 30", face grooved for 1" rope, equipped with pawl brake 84" diameter, hand operated, single reduction cut spur gears, 19 tooth and 106 tooth, 1½" pitch, 10" face, drum shaft 7" diameter drum shaft bearing 7"x14", pinion shaft bearing 4½"x15" of the ring oiling type.

9—New Jay, type CHD, 10 HP. car pullers, complete with Jay HP ¾ HP. DC. rope pullers.

1—Double drum American Hoist and Derrick Co. hoist, type 5/D. Ser. No. 1771. Drum dia. 18" face 36", flange 6", complete with 100 HP G.E. slip ring motor model MFC 5546. Ser. No. 4041004. 840 RPM 2/60/440 v., oil ring bearing, complete with grids and drum control.

1—Hydraulic clutch type endless car haul machine, serial number 10640. Extra heavy type manufactured by Robbins Engineers, Inc. Normal rating 10004.0 at 81 FPM. maximum rating 27,500# approx. at 40 FPM. Fluid coupling feed for maximum torque of 525 ft. lbs., or 27,500 rope pull. ⅝" wire rope. Complete with 30 HP G.E. motor, model 5KH444, Ser. #3448974 2/60/440 v., totally enclosed.

### LOCOMOTIVES

3—6 ton Goodman ball-bearing locomotive, 20" gauge, type 22847.

1—6 ton Goodman ball bearing locomotive, 42" gauge, type 22-AO-47.

1—6 ton Westinghouse locomotive, 20" gauge. Class 6-2-22-C-427.

1—6 ton Jeffrey locomotive, 42" gauge.

6—6 ton GE ball bearing locomotives, 42" gauge, class EM2TMMM11 with EM22-A motors.

1—4 ton Whitcomb Battery locomotive, 20" gauge.

1—4 ton Goodman ballbearing locomotive, 20" gauge, type 42-1-4-T. (with or without gathering reels).

1—6 ton Goodman ball bearing locomotive, 42" gauge type 22AO47.

### MINING MACHINES

1—112AA Goodman DC Universal mining machine, 20" gauge, 4½ ft. cutter bar.

5—CLES, AC, 3 phase, 60 cycle, 220 volt, Sullivan longwall mining machines.

1—Sullivan Shearing Machine, Class CH11, DC 9' cutter bar.

2—Sullivan Longwall Mining Machines, type CH3. 2/60/230 volts, 20" cutter bars.

3—12AA Goodman standard mining machines, 85 HP. 2/60/230 volts, 6' cutter bars.

### MOTOR GENERATOR SETS

1—600 KW Synchronous Ridgeway Motor Generator Set, 1200 rpm. 250 volts DC. 3300 volts, AC, complete with switchboard.

1—80 KW GE motor generator set type GD 150, form A, compd. wound, 227 amps, 250 volts no load, 275 volts full load. 1200 RPM. cont. 50 deg. cont., #1158006 direct connected to 125 HP GE sfp. motor type TS form FK, frame 7356, 2/60/2300 volts, 1200 RPM. 37.6 amps. cont. 40 deg. cont. Excitation 250 volts, 0.9 amps. .74 PF, #4314971, complete with switchboard.

### TRANSFORMERS

2—200 KVA Meisner Electric Co. transformers, voltage 44000/22000 to 440/220. Others from 5 KVA through 15 KVA. Voltage from 7200/120/240, 2400/240/480.

### VIBRATORS

1—Allis Chalmers Aero-Bibo single deck vibrator, size 1½' x 4'.

1—Stephens Adamson two deck vibrator size 4' x 10'.

1—Double deck vibrator size 5' x 6½'.

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2—Dunlop DC electric coal drills, Nos. 472 & 473.

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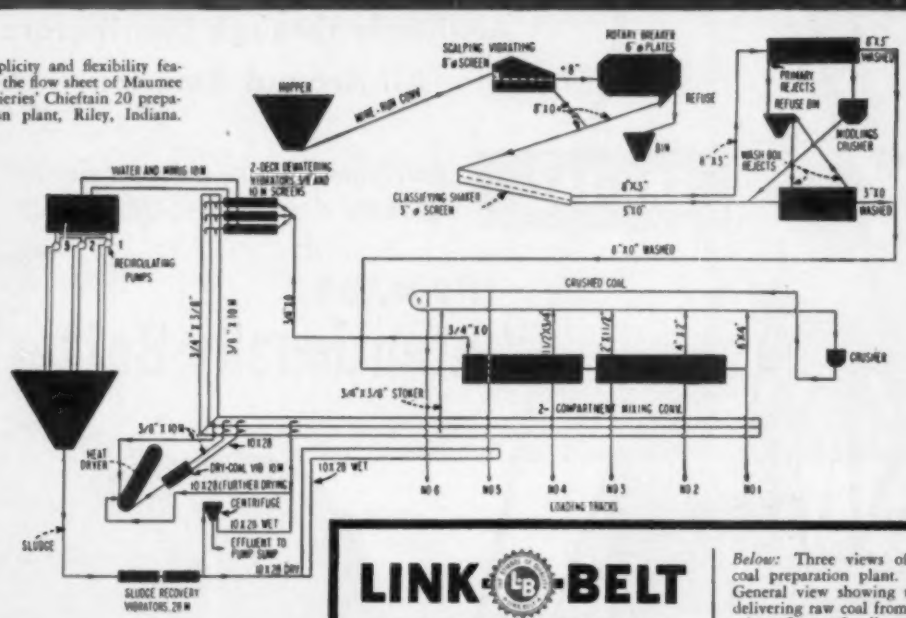


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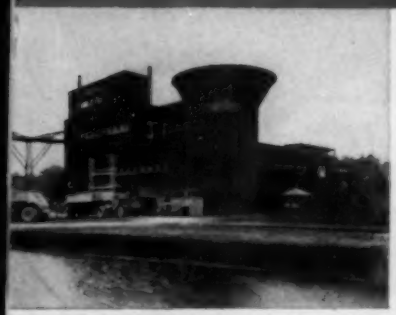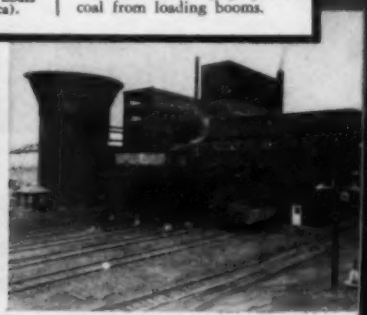
*Below:* Three views of this coal preparation plant. *Left:* General view showing trucks delivering raw coal from strip mine. *Center:* Smaller coal is cleaned separately in Link-Belt Air-Pulsated Washer. *Right:* Delivery side showing railroad cars receiving prepared coal from loading booms.